REALISTIC®

Service Manual

LAB-2100
LINEAR TRACKING
AUTOMATIC TURNTABLE

Catalog Number: 42-2911

CUSTOM MANUFACTURED FOR RADIO SHACK, A DIVISION OF TANDY CORPORATION

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PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforeded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by a ⚠ in the schematic diagram and the parts list.

Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

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SPECIFICATIONS

General

Type	2 speeds, direct drive, linear tracking, automatic turntable.
Platter	Aluminum alloy die-cast, 295mm diameter, 0.65 kg
Tone arm	Static balanced
Headshell	Plug in type
Effective length	165mm
Motor	4 phase, 8 pole magnetic field coreless DC FG servo.

	NOMINAL	LIMIT
Speed	2 speed: 33-1/3 RPM and 45 RPM	
Pitch control range	±4% or more	
S/N (DIN B)	68 dB	60 dB
Wow & Flutter (WRMS)	0.035%	0.07%
Cartridge	Dual magnetic AT-102EP	
Frequency response	20 –20,000 Hz	
Output voltage at 35.4mm/sec	3.5mV at 1 kHz	
Channel separation at 1 kHz	25 dB	20 dB
Tracking force	1 – 1.5 grams	
Stylus tip	0.4 x 0.7mil elliptical diamond stylus	
Power source	120 Volts, 60 Hz AC (220 or 240V 50 Hz for Europe or U.K./Australia)	
Power consumption	17 watts (120V version); 12 watts (220V/240V version)	
Dimensions	4.53(H) x 13.78(W) x 14.96(D) inches/115(H) x 350(W) x 380(D) mm	
Weight	15.43 lbs/7kg with packing	
Accessories	45 RPM adapter	

NOTE: Nominal Specs represent the design specs; all units should be able to approximate these---some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable; in no case should a unit perform to less than within any Limit Spec.

Lubrication of the mechanism is not required. However, whenever a unit is brought in for adjustment or repair, always use good common sense ... clean any dust or dirt from mechanical parts and if moving parts do seem to bind, check for dirt. If necessary, add a very fine film of light-weight specially formulated lubricant.

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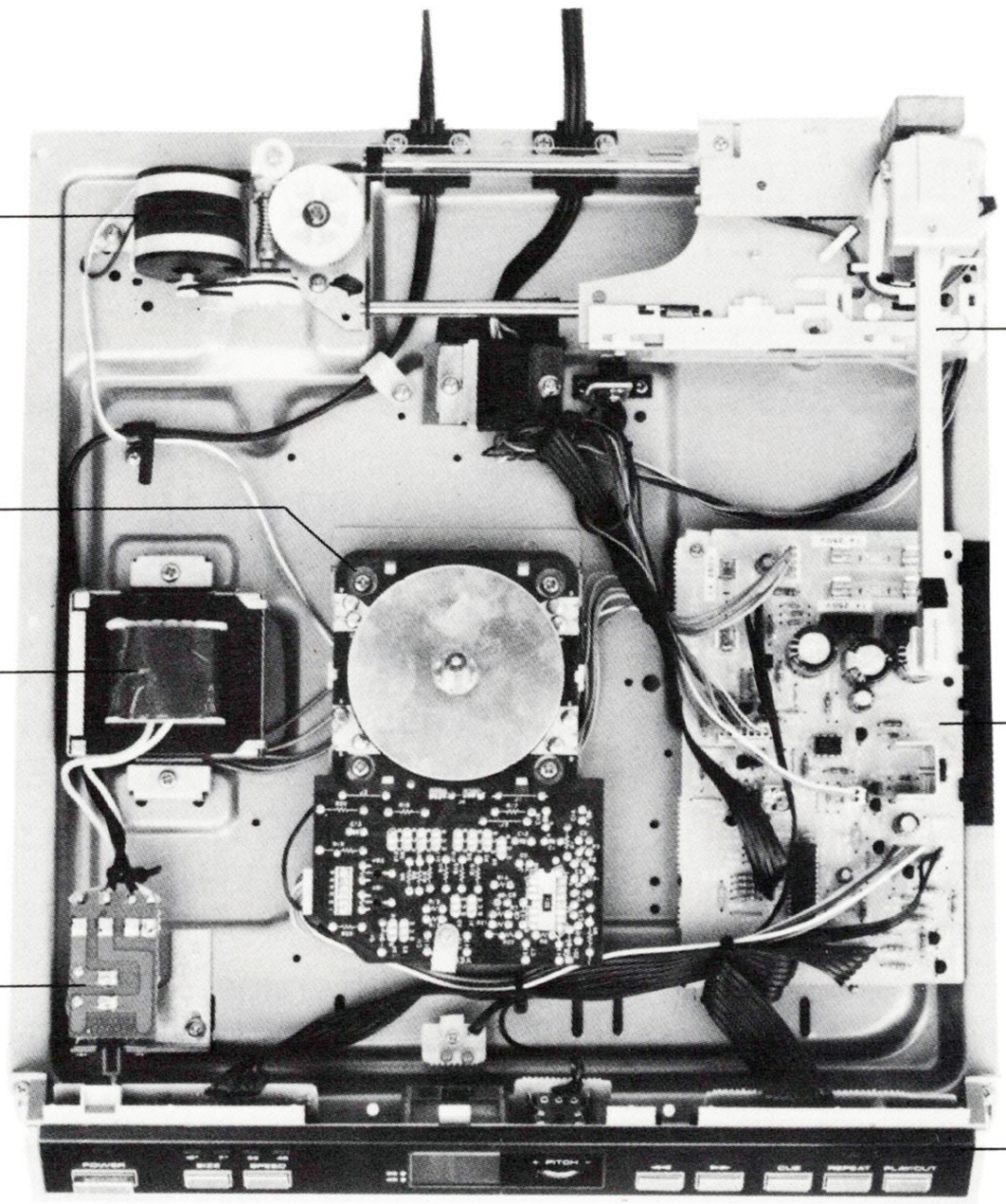
DISASSEMBLY INSTRUCTION

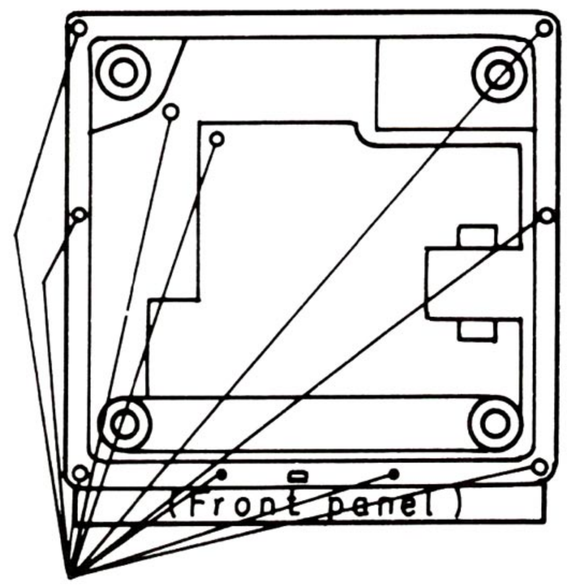
Inside Chassis View



1. Cabinet Removal

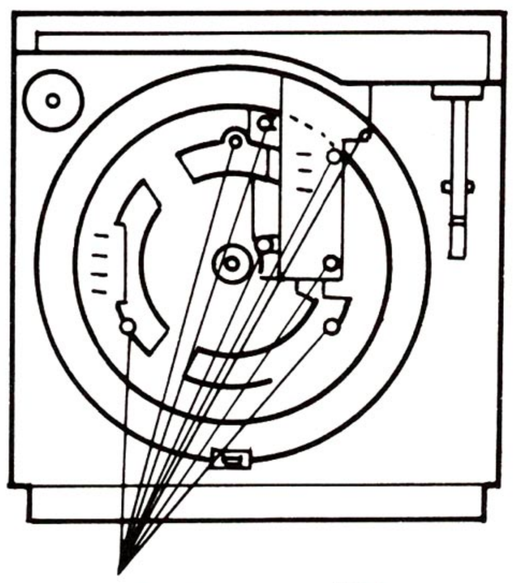
(1) Remove dust cover, turntable and rubber mat. Fasten the tone arm with cushion and vinyl tape.
(2) Remove ten screws (A) from bottom chassis
(3) Remove eight screws (B) from cabinet and remove lower plate.
(4) Move tone arm to the opening of cabinet.
(5) Lift cabinet up and off.

Bottom View

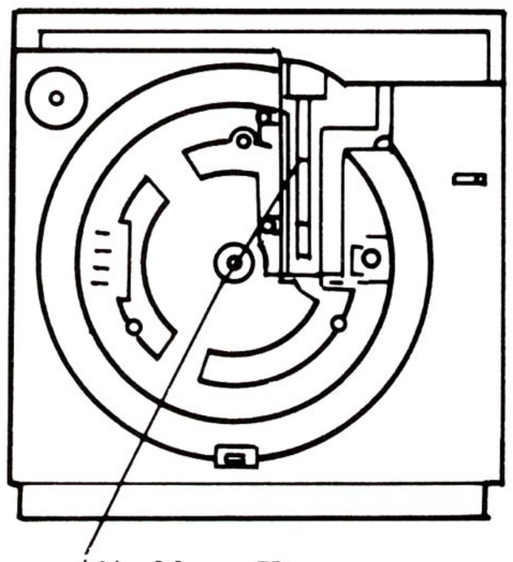


(2) 10 screws (A)

Top View



(3) 8 screws (B)



(4) Move Tone arm to this position.

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2. Motor Removal

(1) Remove five screws (D) from bottom chassis.

(2) Disconnect one connector (D1) from main motor PCB.

3. Main Control Circuit PCB Removal

(1) Remove two screws (E) from bottom chassis.

(2) Disconnect all connectors.

4. Linear Tracking Base Removal

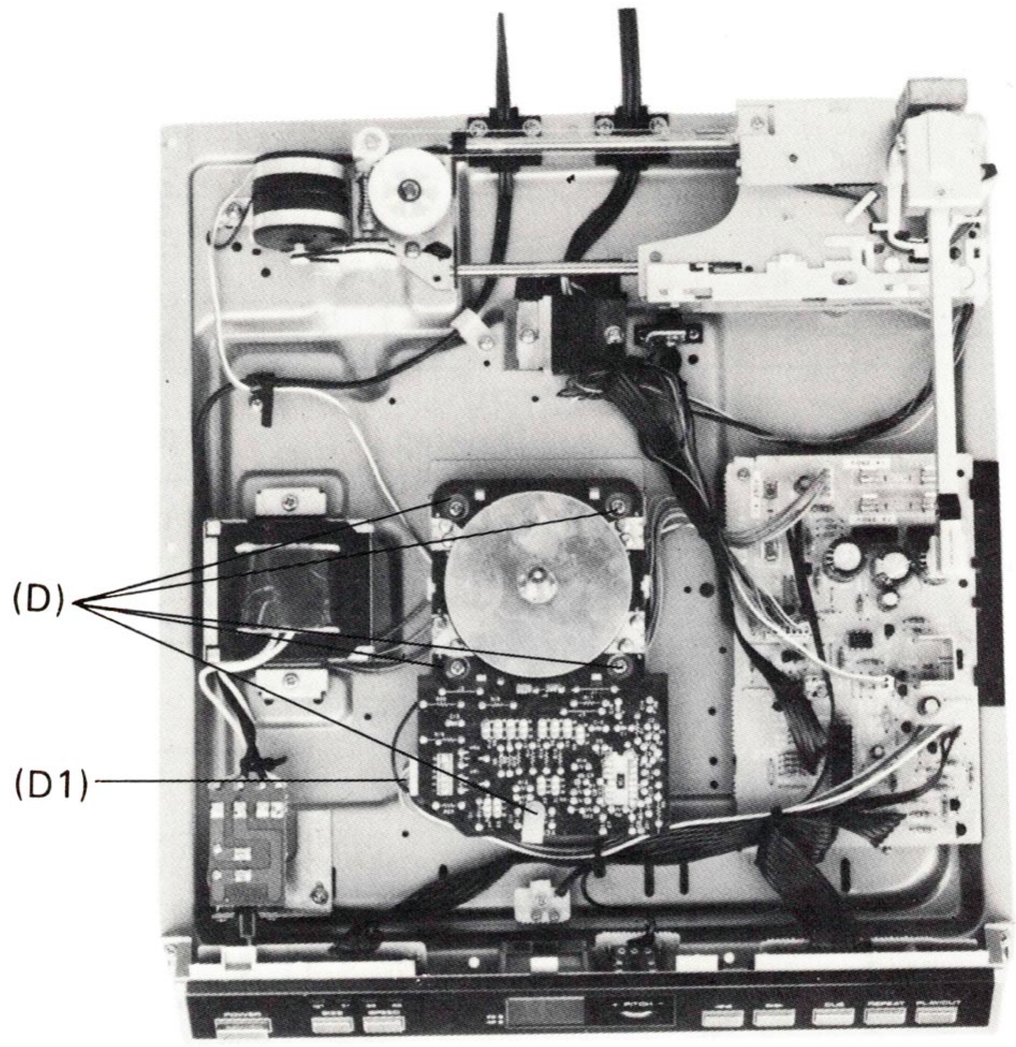
(1) Remove five screws (F) from bottom chassis.

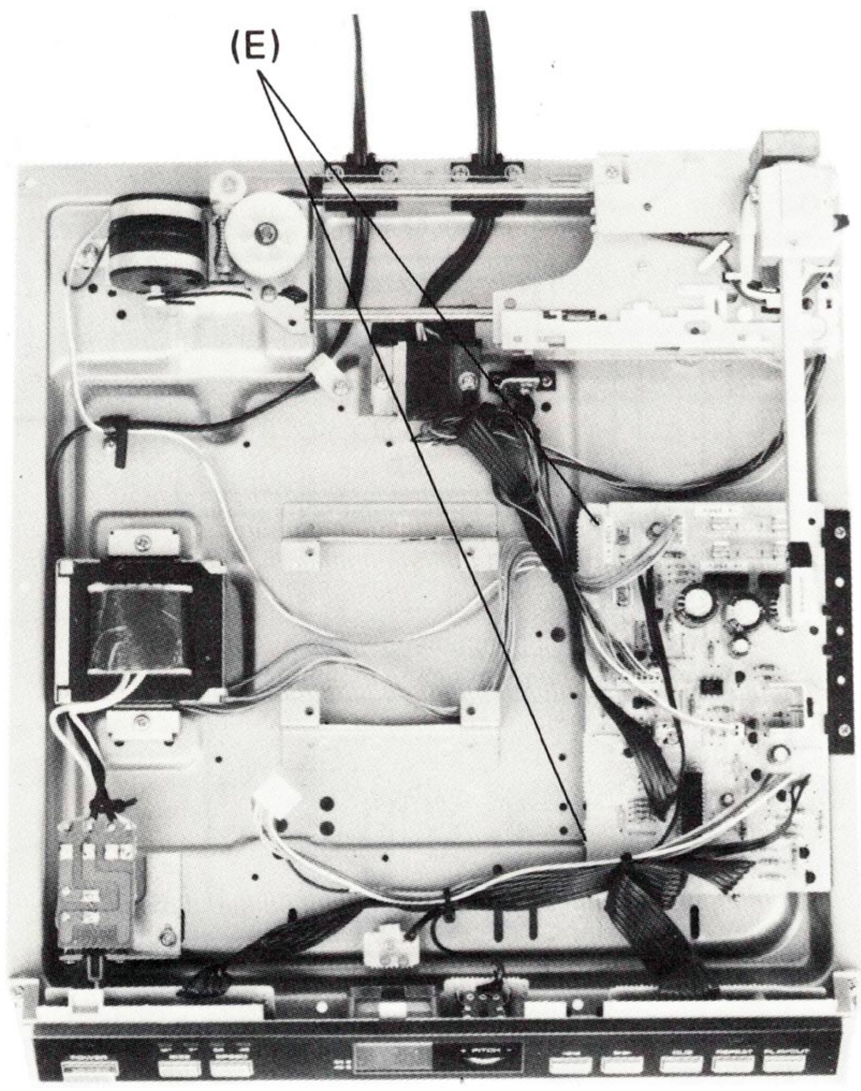
5. Power Transformer Removal

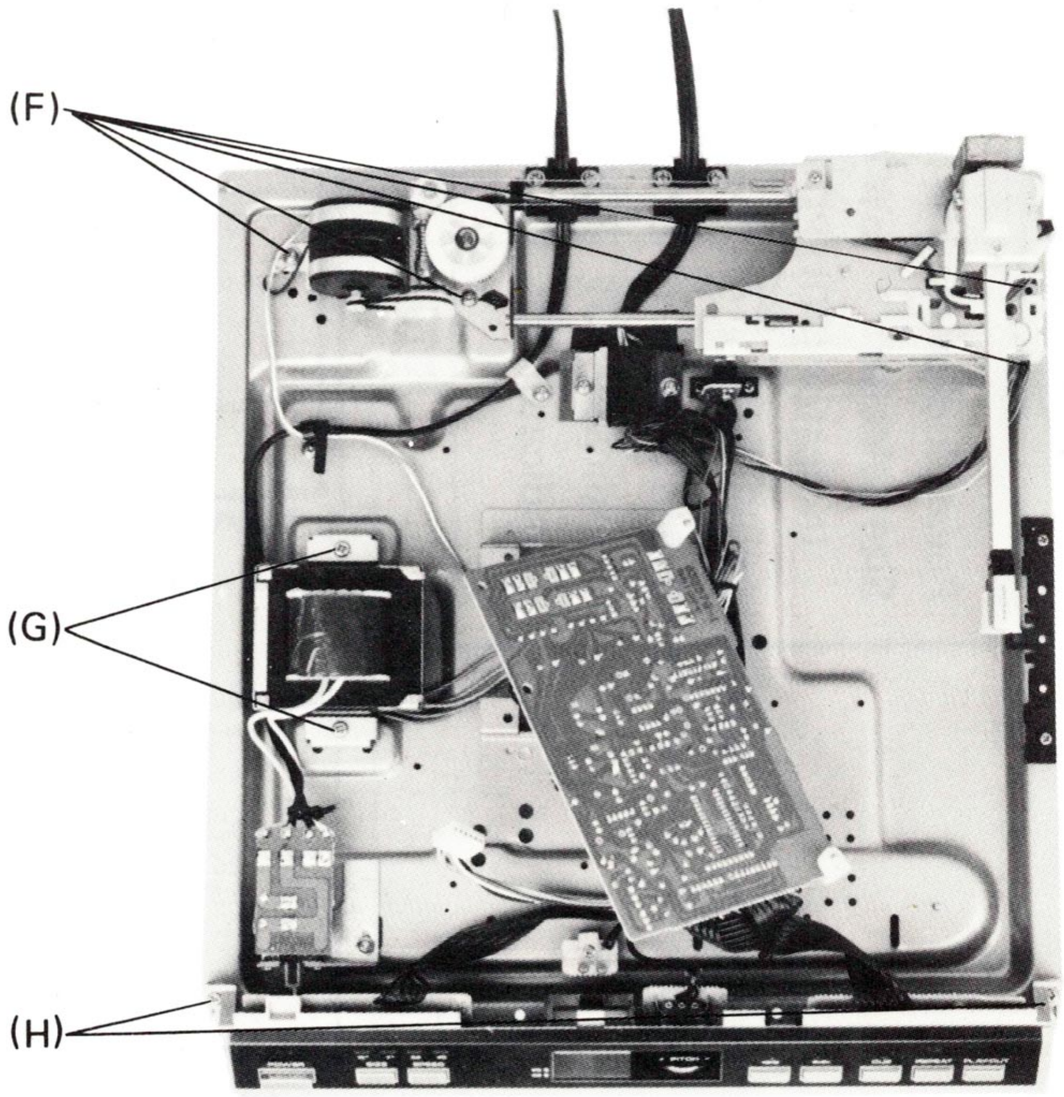
(1) Remove two screws (G) from bottom chassis.

6. Front Control Panel Removal

(1) Remove two screws (H) from bottom chassis.







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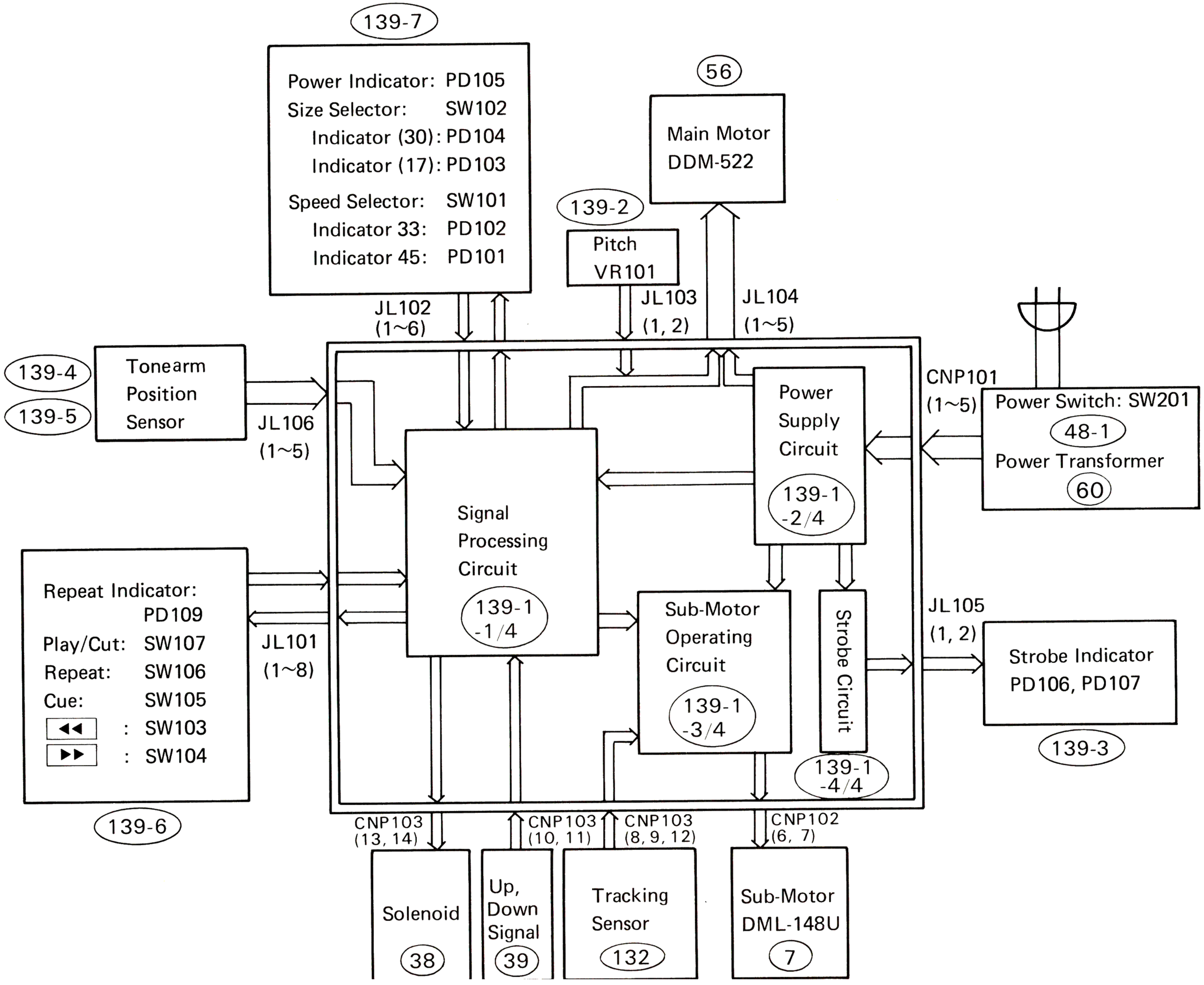
BLOCK DIAGRAM



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ATTACHMENT AND CONNECTIONS OF CARTRIDGE

Plug-in type cartridge: In most cases, the mounting screw supplied with the cartridge will be adequate. Insert cartridge straight into connecting part of tone arm. (See Figure 1.)

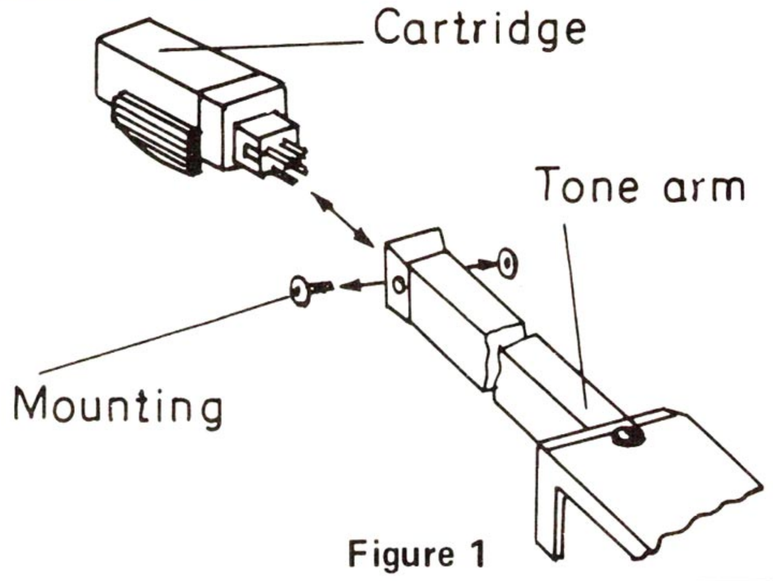


Figure 1

ADJUSTMENT INSTRUCTIONS

1. Adjustment of Tracking Sensor

(1) Set digital voltage meter to DC, 20V range. Connect + to TP101, and – to ground (Pin No. TP104). (See Figure 2.)

(2) Adjust VR102 so that voltage reads 4.3 to 4.5V when tone arm is swung to left side by hand. (See Figure 4.) Voltage should be –4.5V ± 10% when tone arm is swung to right side. (See Figure 4.)

(3) Adjust hex head ⊖ screw to decrease clearance between elevation plate and tone arm rubber to a minimum. (See Figure 3.)

(4) Move tone arm inward so main motor starts rotation and tracking sensor is switched on. Then, lift tone arm up lightly by hand and release to check linearity of vertical drop. In order to align linearity of vertical movement of tone arm within limit, adjust the eccentric shaft (1) (Figure 5) on tone arm base so that voltage reads 0V ± 0.5V.
(Voltage will increase when rotating the eccentric shaft in clockwise direction.)

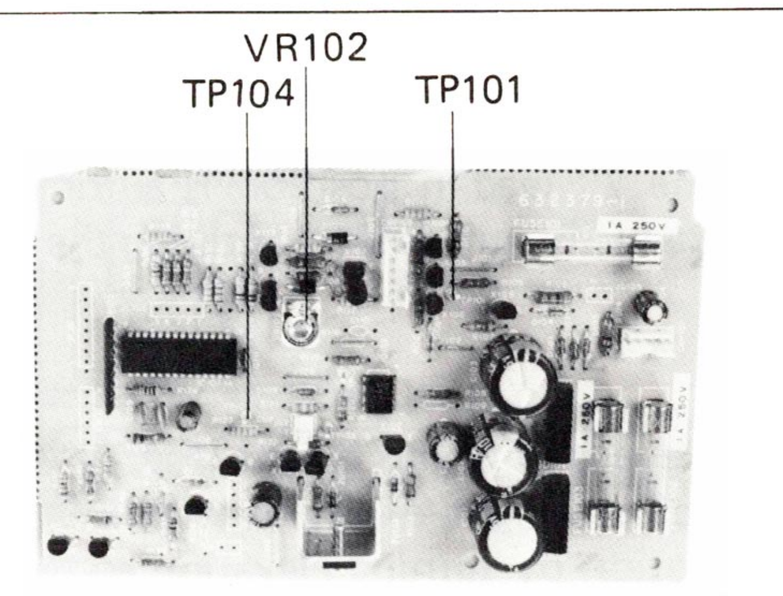


Figure 2

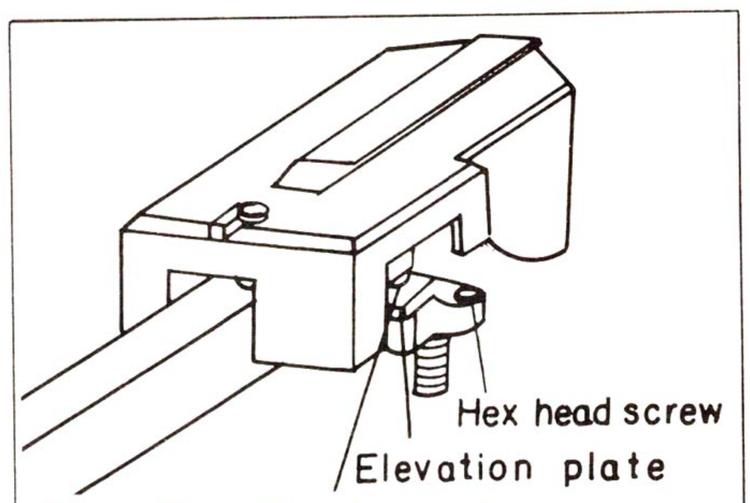
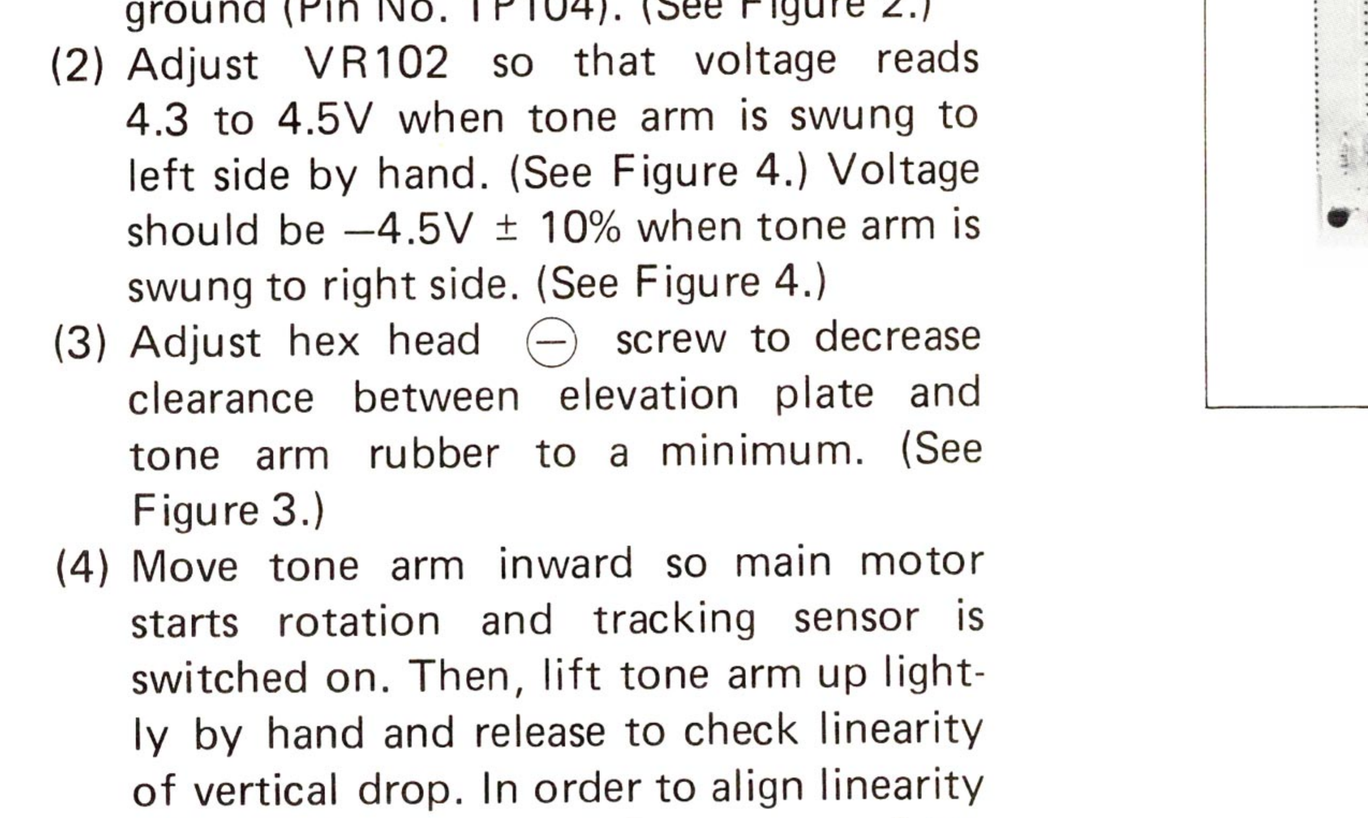


Figure 3


Tone arm weight
Hex head ⊖ screw
Tone arm
Screw for stylus height adjustment
Eccentric shaft for lead-in position adjustment(2)
Eccentric shaft for tracking sensor adjustment.(1)
Figure 5

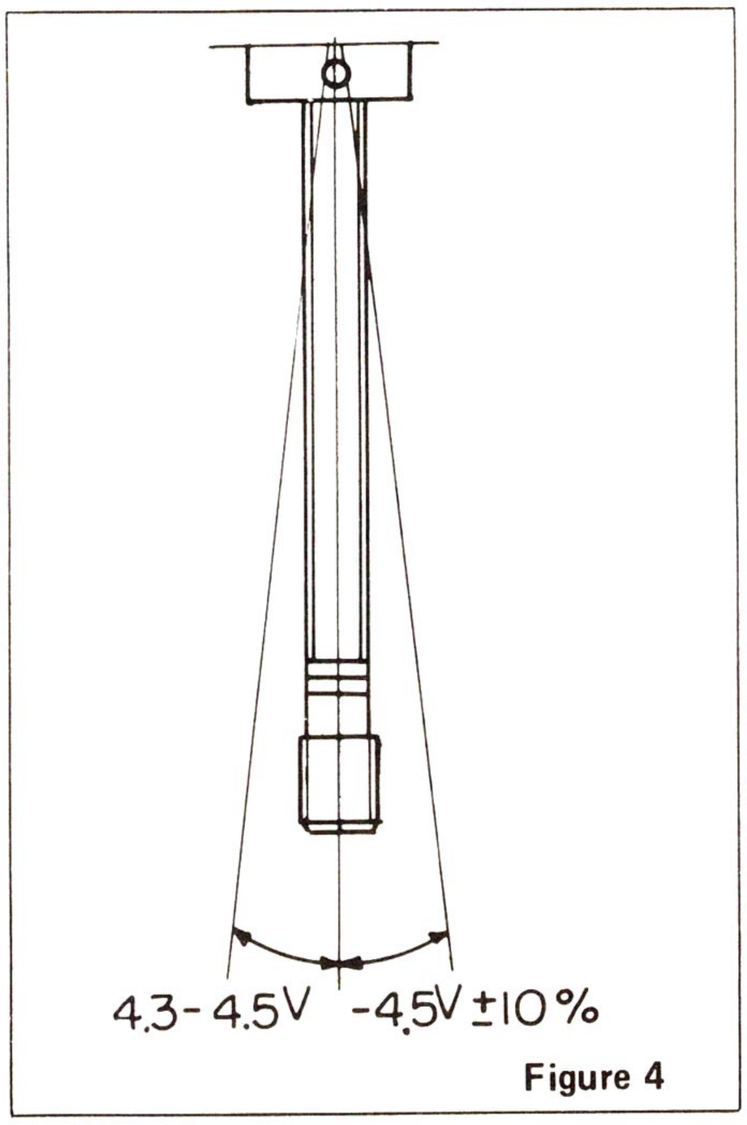


Figure 4

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(5) Lower tone arm with CUE switch; move tone arm to left with ◄◄ switch until the main motor starts rotation. Lift tone arm by pushing CUE switch on. Check that voltage deviation is within 0.5V of voltage measured in Step (4) above (0V ± 0.5V).

2. Adjustment of Lead-in position

(1) The tone arm should perform lead-in motion and descend to 12" position after pushing the PLAY switch on and setting SIZE selector to 12".
To change the descending position, adjust the eccentric shaft (2) (Figure 5) on tone arm base so that lead-in descend position occurs within the following tolerances:

12" descending position 11.50 – 11.69in./292 – 297mm. (from main motor shaft)
7" descending position 6.57 – 6.77in./167 – 172mm.

The 7" lead-in position is automatically fixed by the adjustment for 12". (Lead-in position moves gradually outward by rotating the eccentric shaft (2) in a clockwise direction.)

3. Adjustment of Stylus height (Fig. 6)

(1) Adjust height of stylus within 3/16 – 9/32in./5 – 7mm from surface of disc at lead-in and return motion by turning elevation screw. The screw for stylus adjustment is located on the tone arm pivot cover.

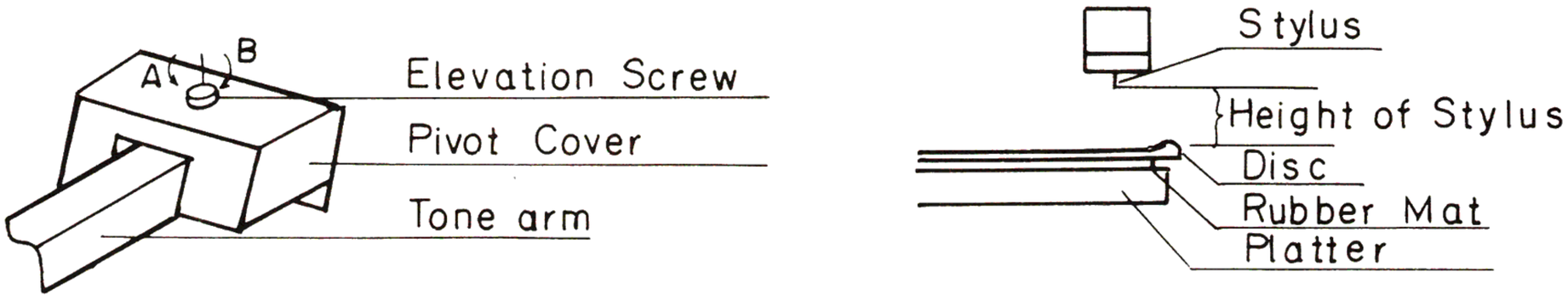

Figure 6

When height of stylus is too low, turn elevation screw counterclockwise (direction of arrow A); When it is high, turn it clockwise (direction of arrow B).

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4. Adjustment of Direct Main Motor speed

(1) Set VR201 (50k ohm) to its center position (25k ohm).

(2) Set SPEED to 45 rpm and adjust semi-fixed resistor VR1 until the strobe bars for 45 rpm become stationary.

(3) Set SPEED to 33-1/3 rpm and adjust semi-fixed resistor VR2 until the strobe bars for 33-1/3 rpm become stationary.
(Speed increases by rotating semi-fixed resistors, VR1 and VR2, counter-clockwise viewed from cupper foil side of main motor control PCB.)

5. Adjustment of POWER Button height (Fig. 7)

(1) Remove screw securing the switch bracket.

(2) To raise button height, move switch bracket to front.

(3) To lower button height, move switch bracket to back.

(4) After adjustment, fasten screw again.

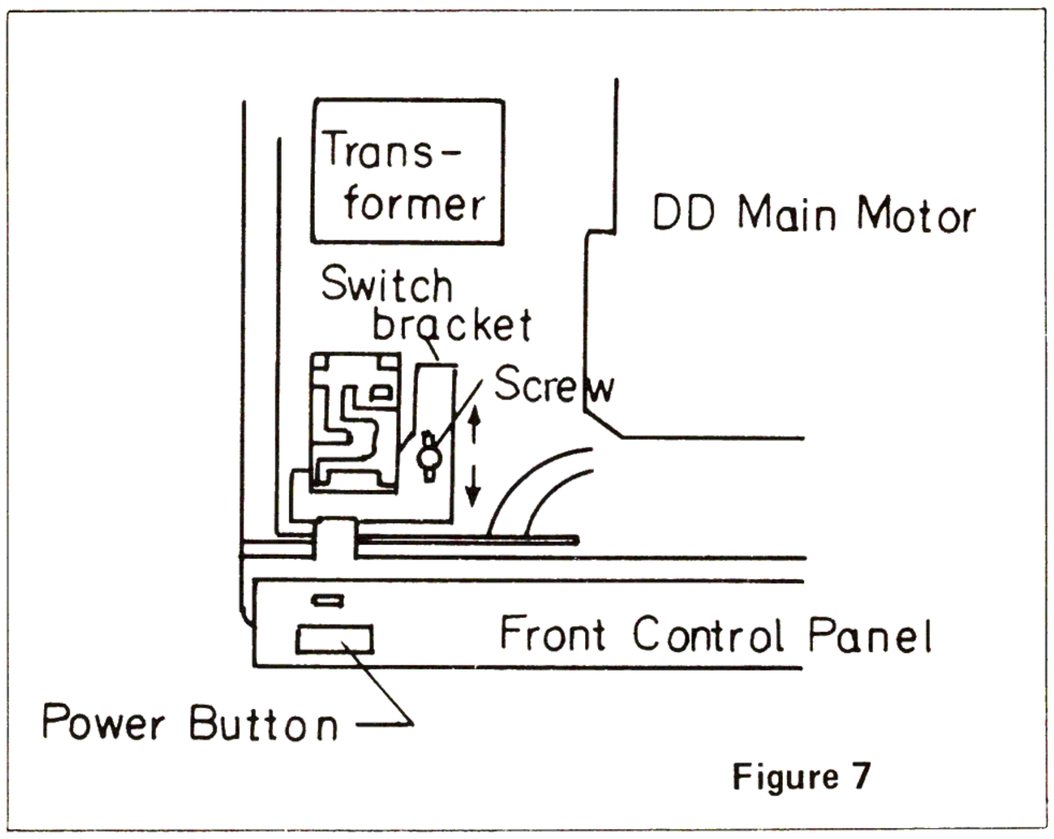

Figure 7

REPLACEMENT INSTRUCTIONS

1. Tone arm Replacement (See Figs. 8, 9 and 10)

(1) A spring (Fig. 9, 107) of the tracking sensor holder (Fig. 9, 106A) must be attached to the tone arm chassis.

(2) When installing the lifter mechanism assembly (Fig. 9, 37A), the U-portion (Fig. 8A, 3) of elevation lever (Fig. 10, 24) must be inserted between washer (Fig. 8A, 4) and spring pin (Fig. 8A, 2) of the elevation spindle (Fig. 8A, 1).
Pay attention that the U-portion (Fig. 8B, 3) of the elevation lever (Fig. 10, 24) must not touch the elevation spindle (Fig. 8B, 1).
The clearance between U-portion and elevation spindle should be adjusted to about 1mm. (See Figure 8B.)

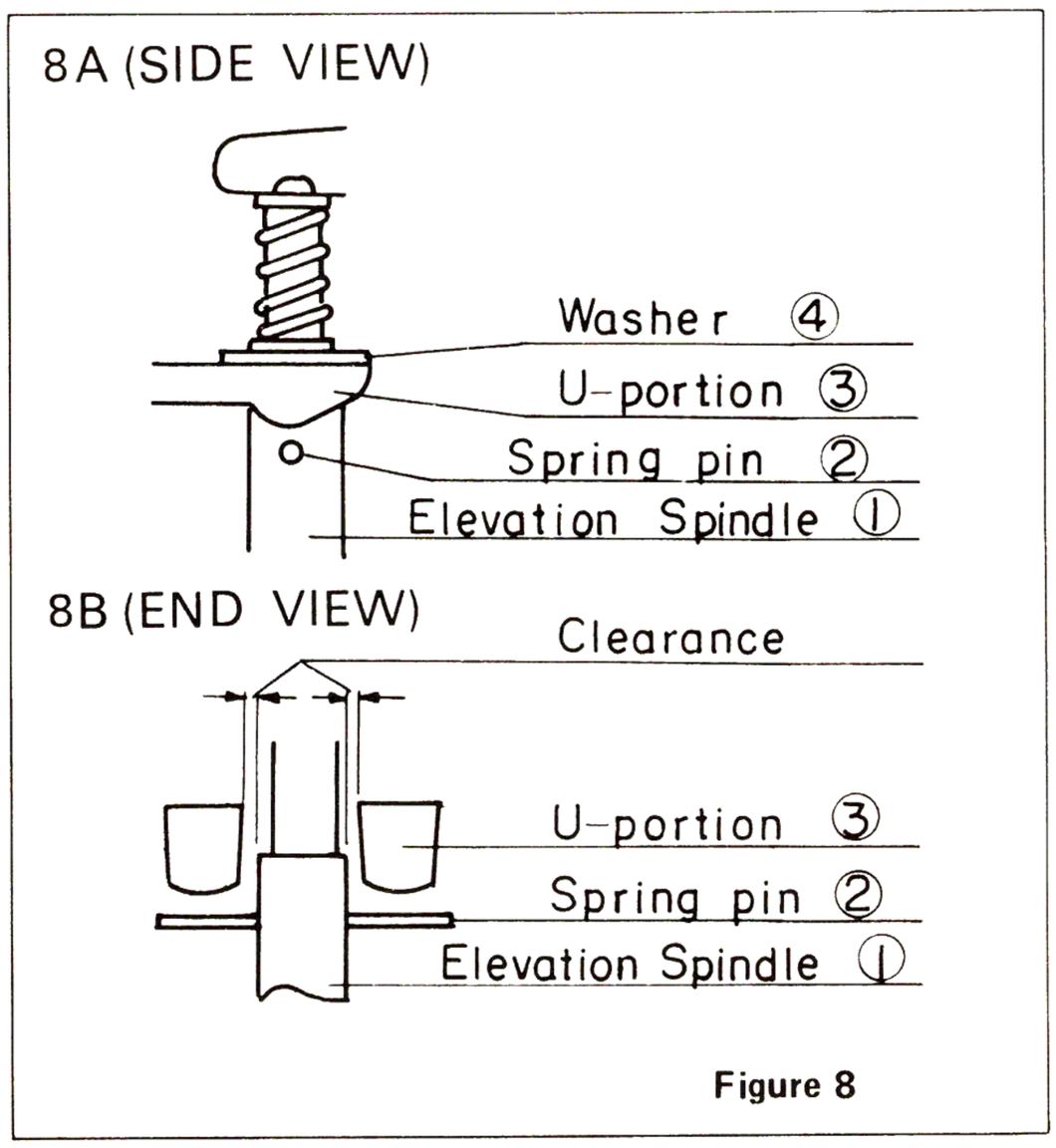

Figure 8

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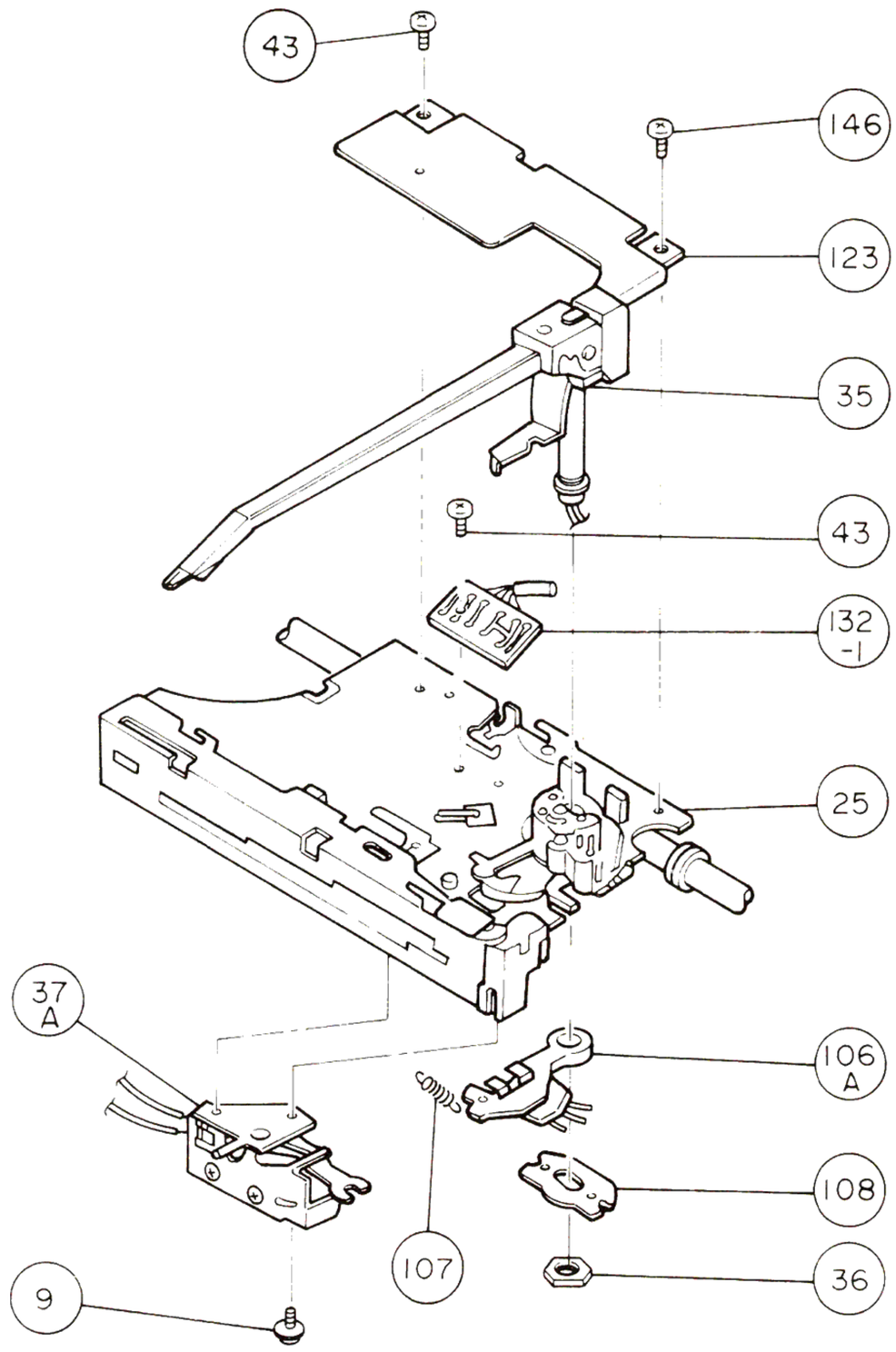
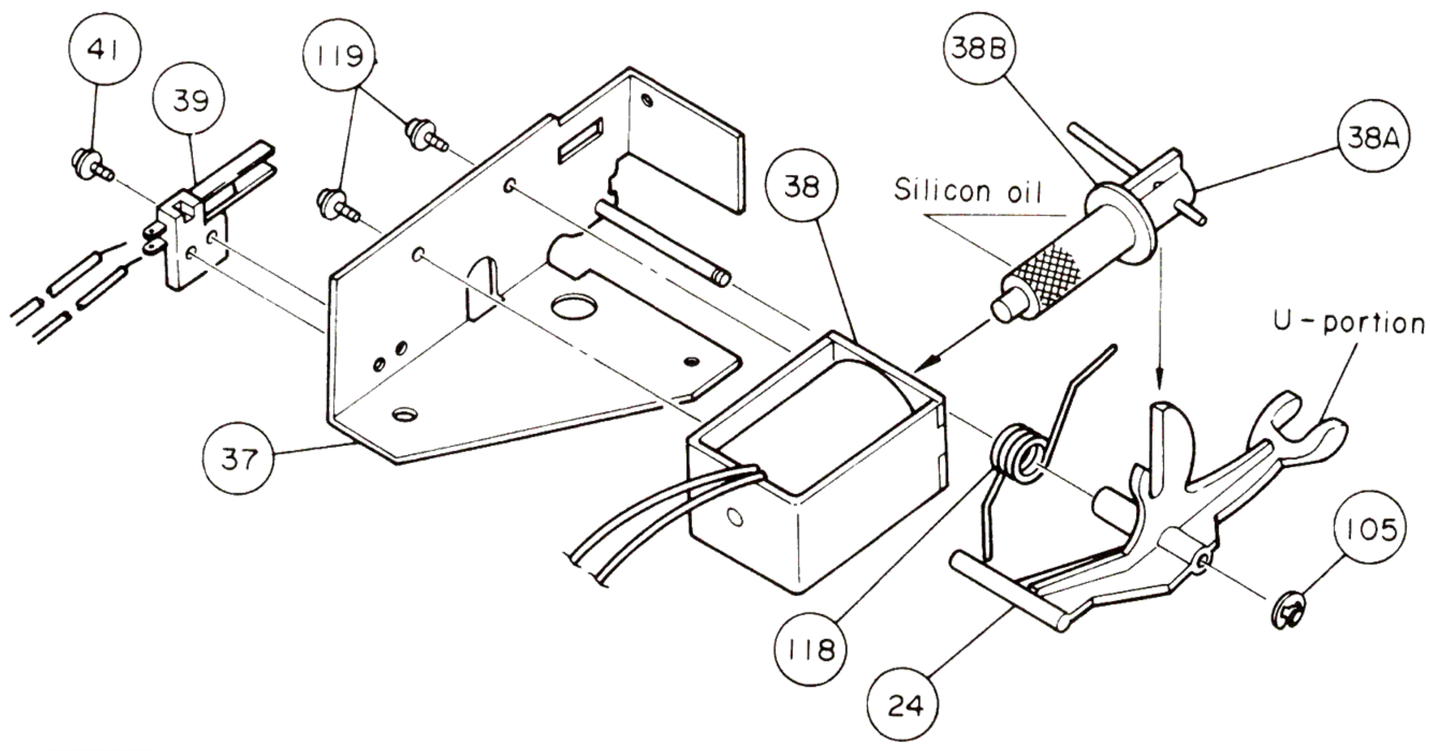


9. Screw, TPT + 3 x 6
25. Base, Tone arm
35. Tone arm Ass'y
36. Nut M10, Tone arm
37A. Lifter Mechanism Ass'y
43. Screw, BT + 3 x 6
106A. Holder, Tracking Sensor Ass'y
108. Washer, Tone arm
123. Plate, Tone arm Base Screen
132-1. Tracking Sensor PCB Ass'y
146. Screw, BT + 4 x 10

Figure 9



24. Elevation Lever
37. Plate, Solenoid Base
38. Solenoid Ass'y
38A. Spindle, Solenoid Ass'y
38B. Washer, Solenoid Ass'y
39. Switch, Leaf
41. Screw, TPT + 3 x 5
105. E-washer, E-2
118. Spring, Coil
119. Screw, TP + 3 x 4

Figure 10

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2. Lifter Mechanism Replacement

(See Figs. 10, 11, 12, 13.)

(1) For assembly procedure, refer to Fig. 10.

(2) Set coil spring (118) after twisting 450° (1-1/4 turns); refer to Fig. 11.

(3) For stroke adjustment of solenoid (38), refer to Fig. 12.

(4) When installing leaf switch (39), observe that:

4-1) When solenoid (38) is released, the contacts of leaf switch (39) should be touching (closed). When solenoid (38) is engaged and leaf switch (39) contact open, the amount of travel should not exceed 0.5mm. (See Figure 13.)

4-2) Leaf switch (39) terminal or wires must not touch the solenoid holding plate (37).

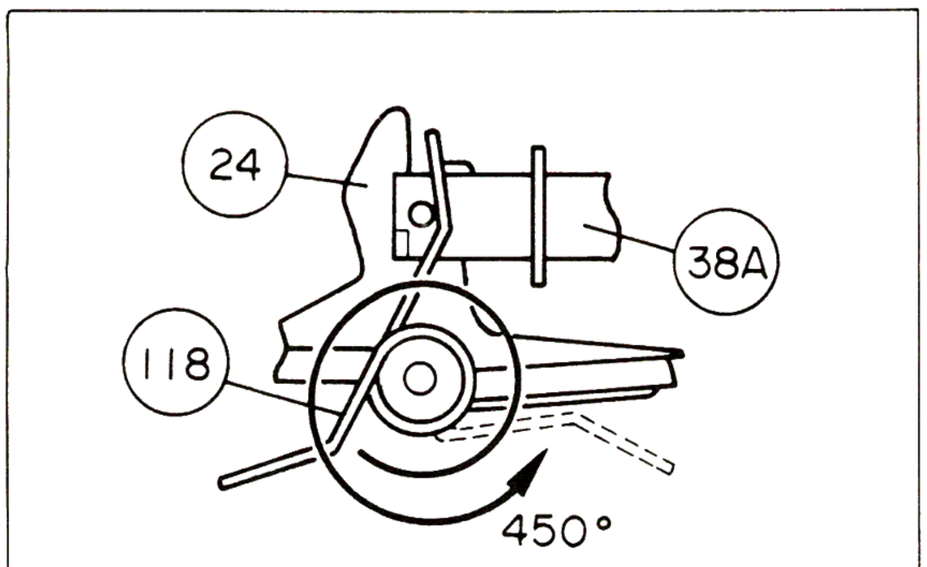

Figure 11

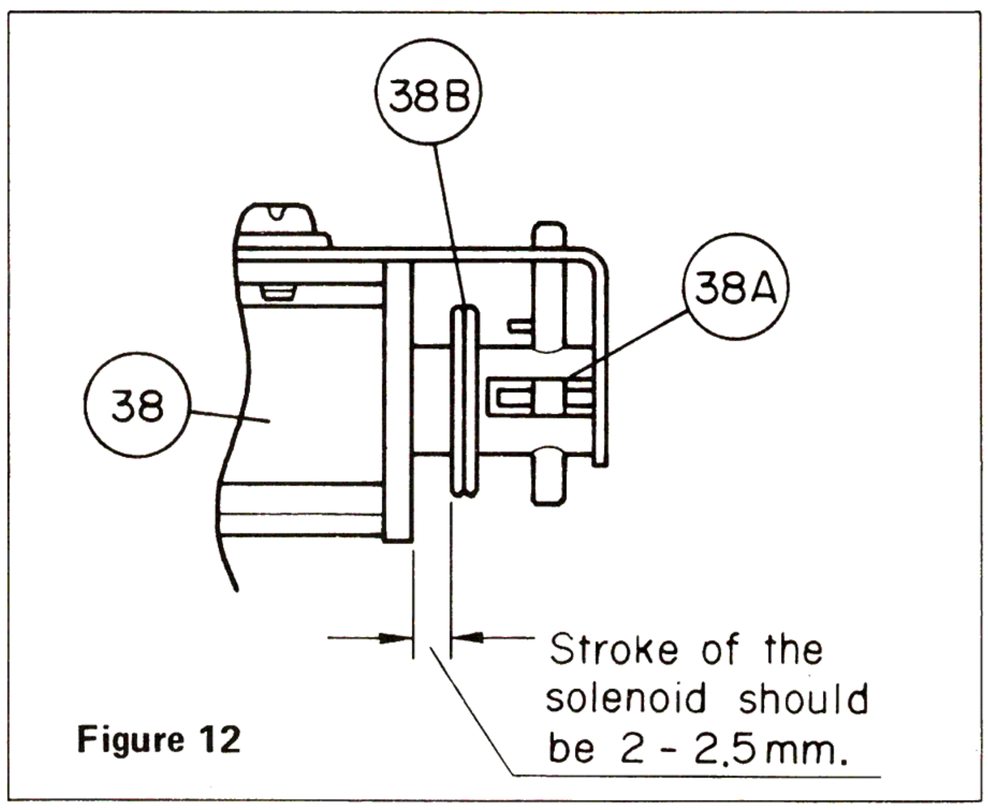

Figure 12

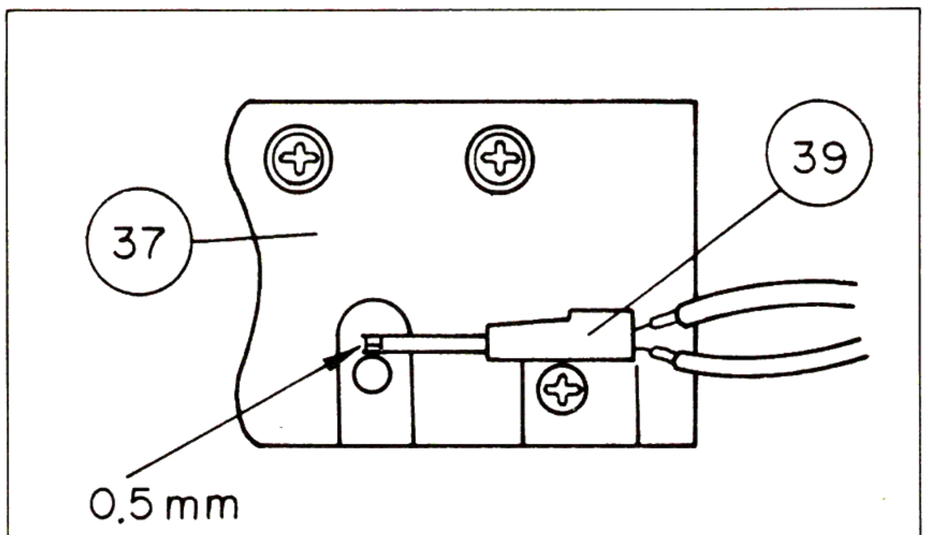

Figure 13

3. Dust Cover Replacement (See Fig. 14.)

To replace dust cover, open dust cover, hold near hinge, and pull upward to remove. To install a new one, align hinge with slotted hole and push down.

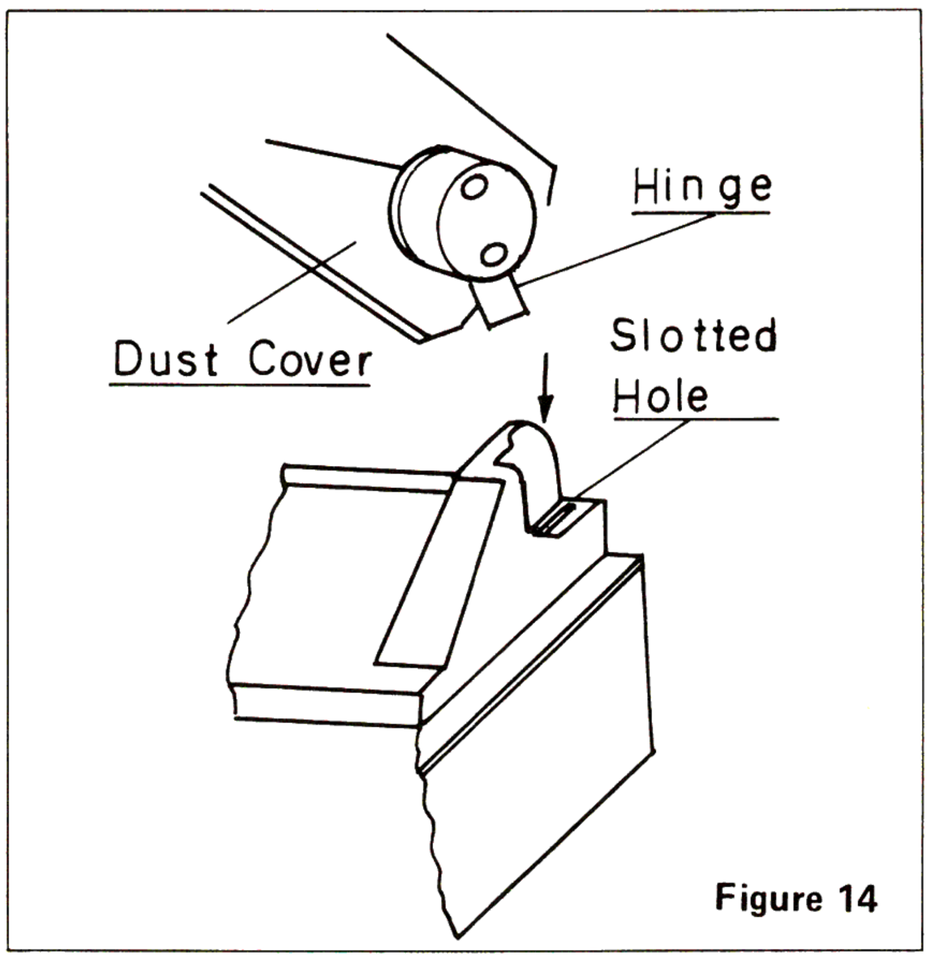

Figure 14

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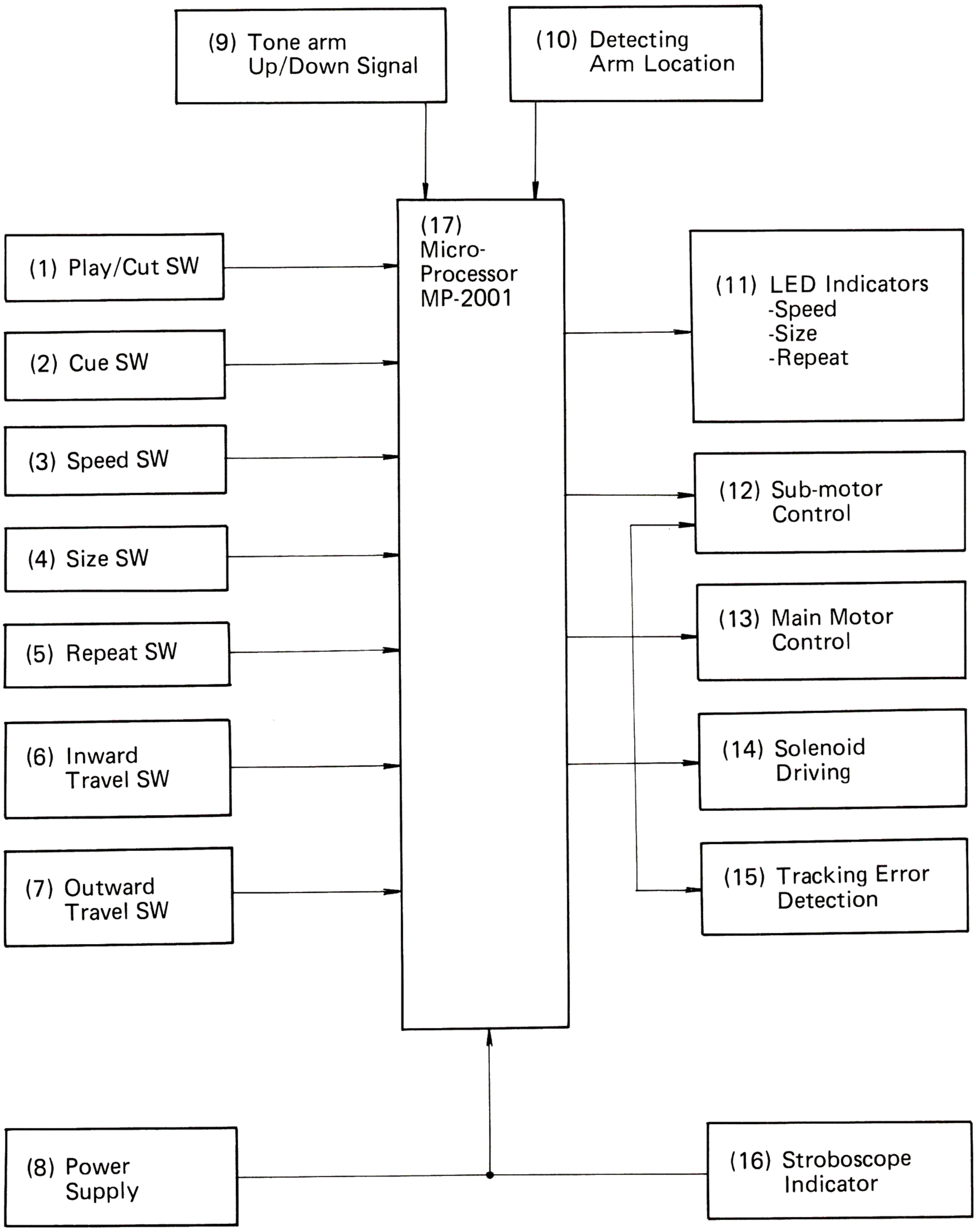
PRINCIPLE OF OPERATION FOR CONTROL CIRCUIT

Block Diagram



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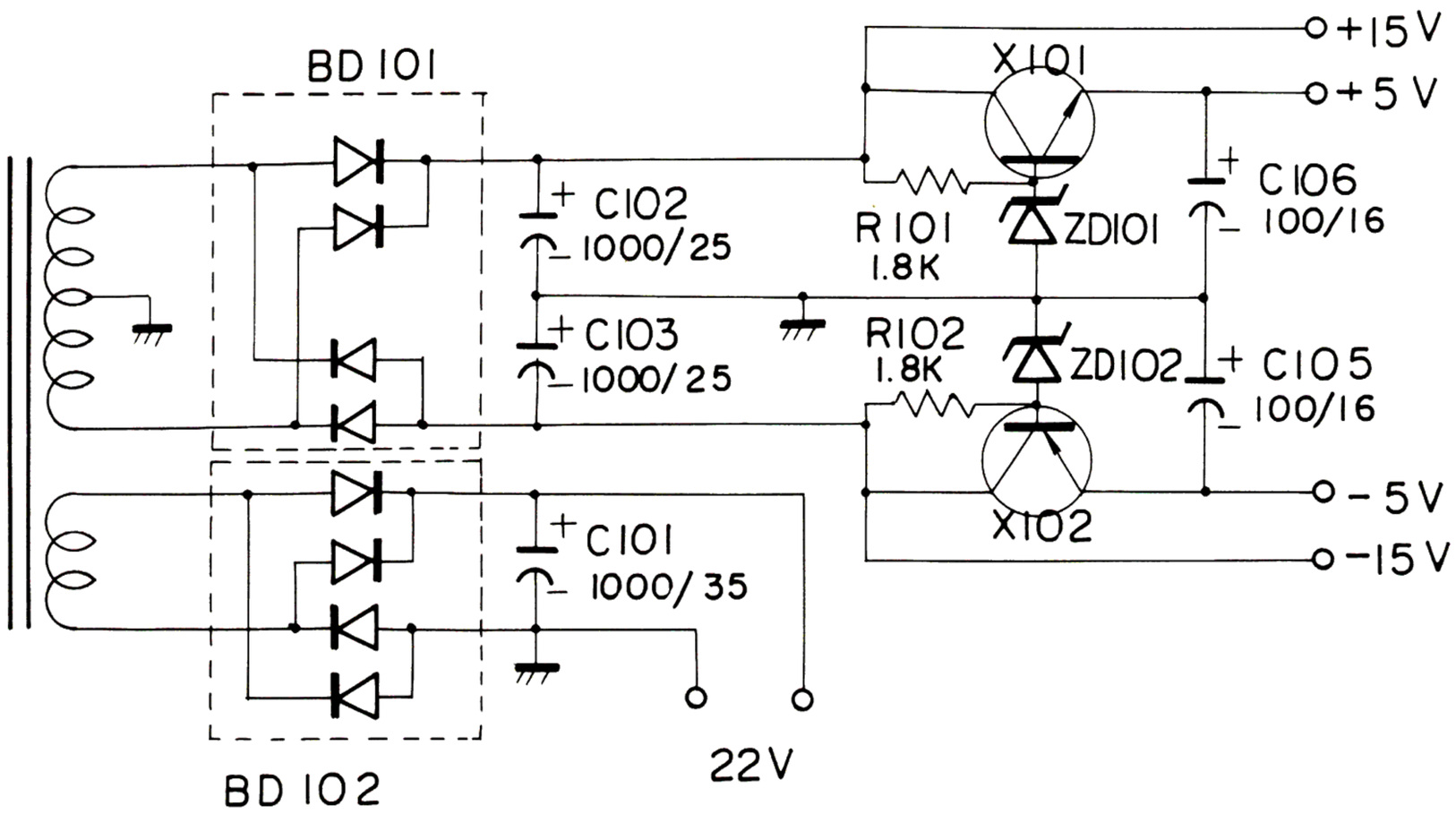
Refer "Explanation of Automatic Mechanism" (next chapter) as for (1) to (7).

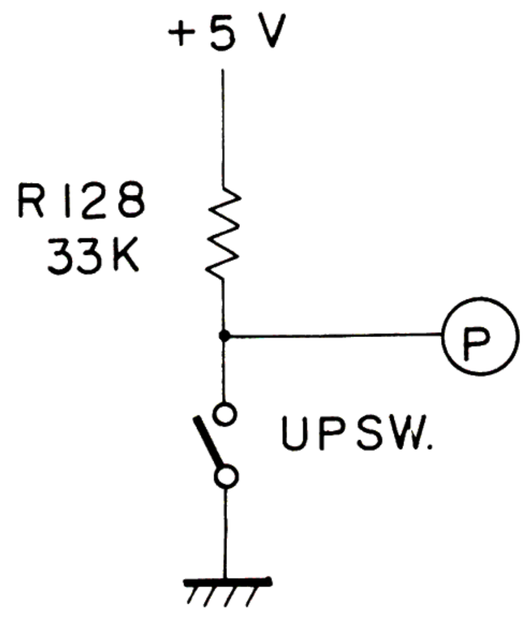
(8) Power Supply

Generates three DC power sources:
+/— 15V for IC102, sub-motor drive and solenoid drive.
+/— 5V for logic circuit.
22V for main motor drive.



(9) Tone arm UP/DOWN signal

a) Tone arm UP Switch
"L" level at Ⓟ tells that UP motion of tone arm has been completed, and also inhibits function of detection circuit of tracking error.
"H" level at Ⓟ tells that tone arm position is other than UP.



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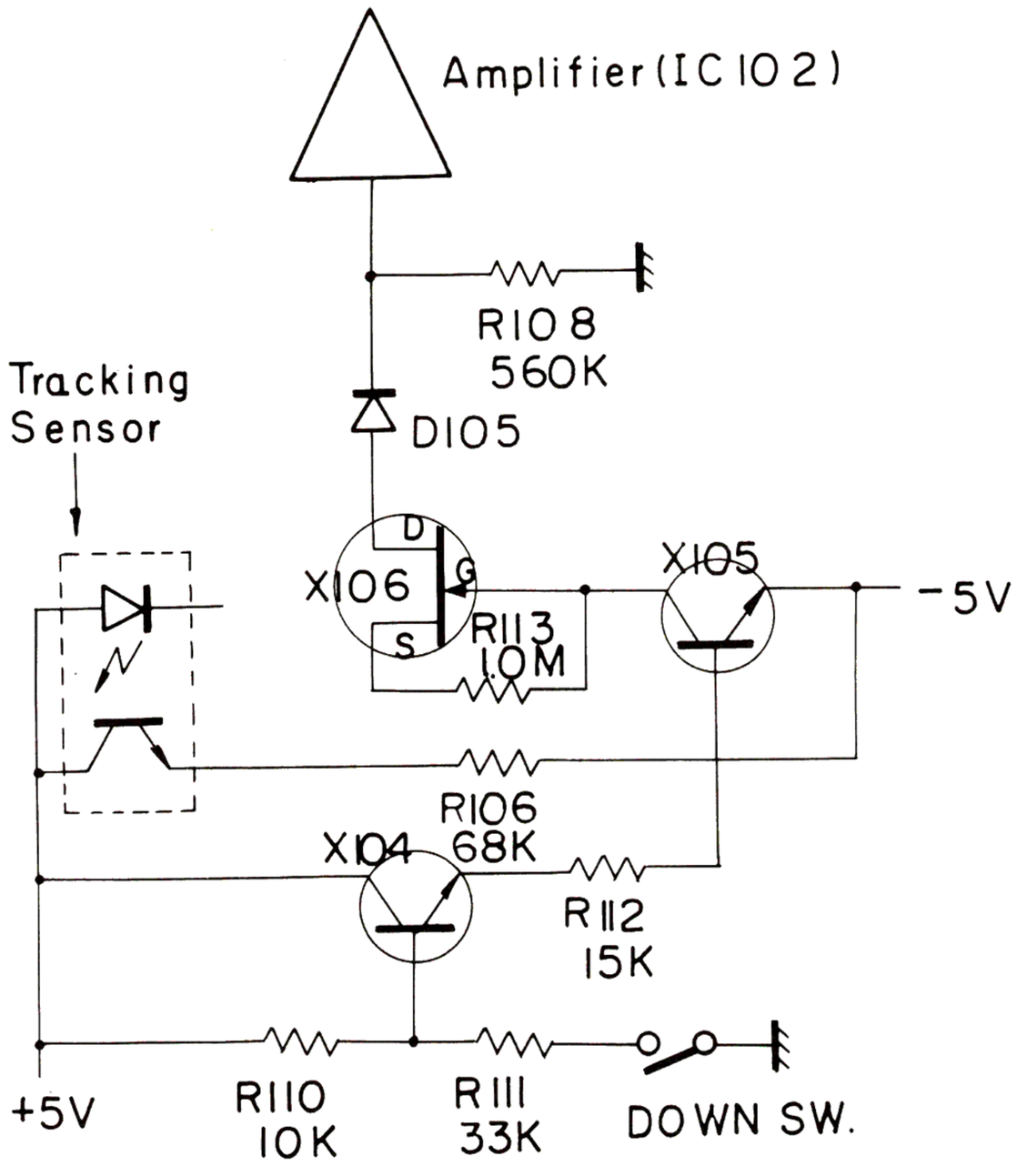
b) Tone arm DOWN Switch

Down switch is closed when elevation-plate contacts with tone arm.

Down switch is opened to transfer signal of tracking error to amplifier when cartridge is tracking groove on a disc.

Down switch is closed when stylus tip leaves surface of the disc. As a result of closing Down switch, X104 and X105 turn on and switching element X106 turns off to interrupt signal of tracking error to amplifier.



(10) Detecting Arm Location

One LED and three photo transistors are employed to detect the arm position. As the tone arm moves, slit plate (44) moves and light from the LED falls on the photo transistor(s) in accordance with the slit on the plate. The lit photo transistor(s) conducts and sends signals to microprocessor pins 22, 23 and/or 24.

For example, when the tone arm is at "rest" position, slit plate is in the far right position so the left side of the plate is between the LED and photo transistors. As you will see from the illustration, left side of the plate has slit in the middle height position, so the photo transistors on the upper (PX101) turns on and sends a signal (H level) to pin 22 of microprocessor.

The combination of the level at three pins tells the microprocessor the position of tone arm as follows.

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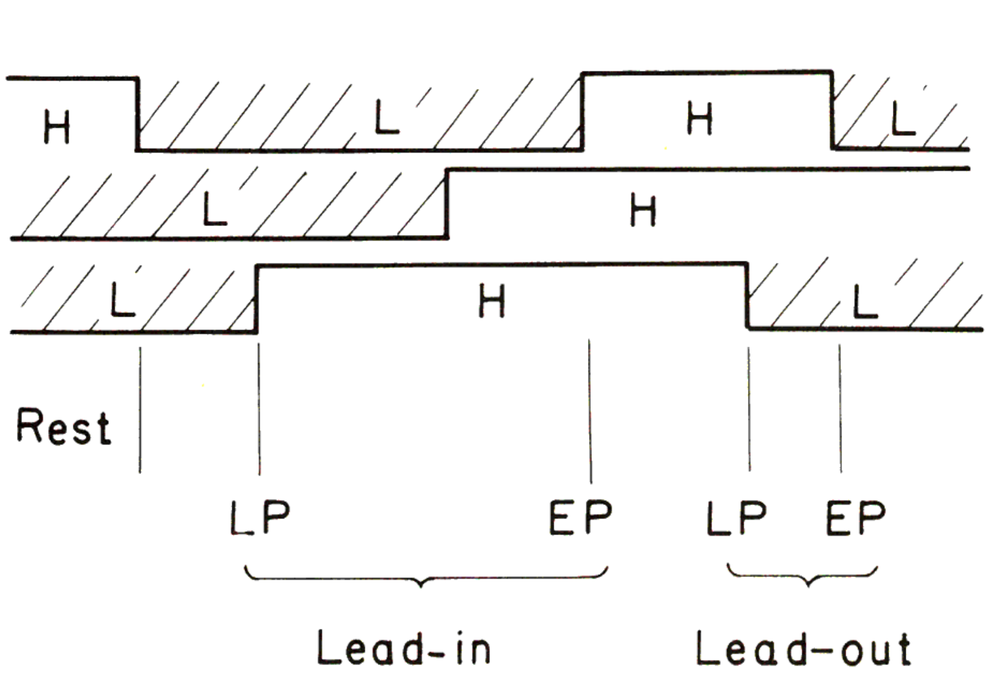
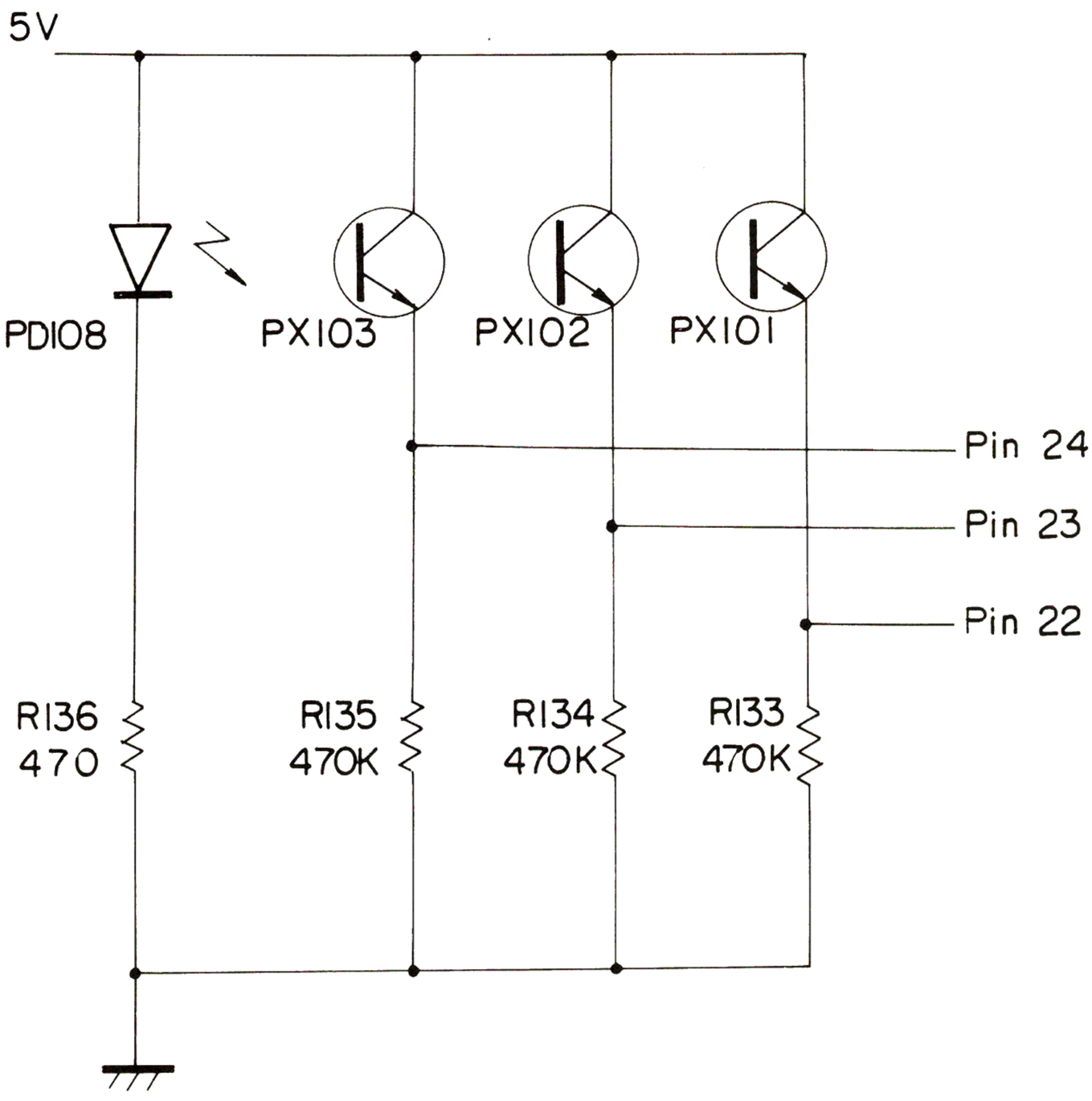
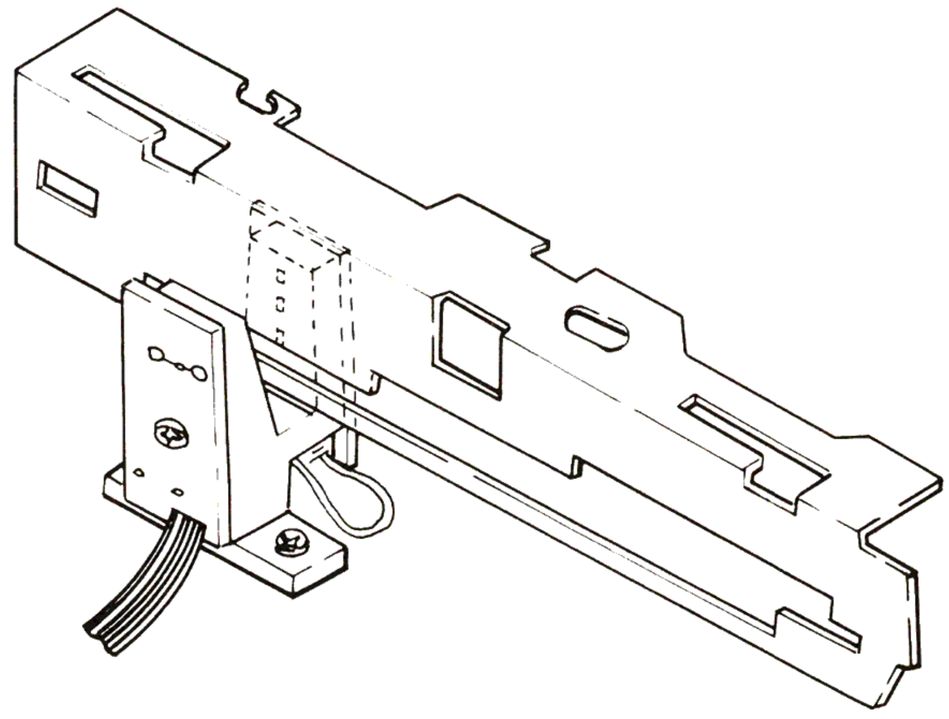
Pin 22	Pin 23	Pin 24	Tone arm Position/Movement
H	L	L	At Rest
L	L	L	Rest to Disc
L	L	H	12″ disc starts but 7″ not yet
L	H	H	— Nil —
H	H	H	12″ disc or 7″ disc playing
H	H	L	12″ disc finishes but 7″ still playing
L	H	L	Returning to rest



Microprocessor	
EP	22 Pin
Return	23 Pin
LP	24 Pin





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(11) LED Indicators

Switches LED indicators on and off.

a) Speed Indicator:
Pin 11 of microprocessor becomes L when power is switched on and X116 turns on and PD102 (for 33rpm) lights.
When speed button is pressed, pin 12 of microprocessor becomes H and PD101 (for 45rpm) lights.

b) Size Indicator:
Pin 10 of microprocessor becomes H when power is switched on. X115 and X118 turns off and PD104 (for 12") lights.
By pressing SIZE button, level of pin 10 becomes L and PD103 (for 7") lights.

c) Repeat Indicator:
PD109 (for Repeat) lights when pin 9 of microprocessor becomes L.

(12) Sub-motor Control

For inward/outward travel, pin 1 of operation amplifier (IC102) becomes 0V.

For inward travel, output level of pins 15 and 16 of microprocessor becomes H and L and it switches motor driving voltage to (—) so the tone arm travels inward.

For outward travel, output level of pins 15 and 16 of microprocessor becomes L and H and it switches motor driving voltage to (+) so the tone arm travels outward.

(13) Main Motor Control

a) L signal at Pin 12 of microprocessor turns motor on.

b) H signal at Pin 12 of microprocessor turns motor off.

c) L signal at Pin 11 of microprocessor switches revolution speed to 33 rpm.

d) H signal at Pin 11 of microprocessor switches revolution speed to 45 rpm.

(14) Solenoid riving

Energizes solenoid to descend tone arm.

When tone arm needs to be pulled down, both pins 18 and 19 of microprocessor becomes H.

Within 2 seconds, pin 19 of microprocessor becomes L and solenoid is kept energized by H signal from pin 18.

(15) Tracking Error Detection

Detects the slant of tone arm with photo-sensor and corrects the error. The pitch between each groove of disc is not uniform. Soft passages will have smaller groove while at music peak the groove will be larger/deeper. This circuit is to detect the pitch of groove and move tone arm so the stylus descends on the groove perpendicular. When tone arm is in up position, this circuit is de-activated.

When the voltage at TP101 increases, the output of pin 7 of IC102 decreases, and tone arm moves inward +5V: When it slants outward, light decreases and voltage becomes about —5V. VR102 adjusts the sensitivity of photo-sensor: it should be adjusted so the tone arm slants inward at maximum and makes the voltage at TP101 almost +4.5V.

When the voltage at TP101 increases, the output of pin 7 of IC102 decreases, and tone arm moves inward to correct inward slant. But, when tone arm slants outside (—), output is interrupt by D105 and no correction is made.

The tracking error calibration circuit is disabled when:
1) Tone arm is in up position (Pin 25 of microprocessor is L).
2) Tone arm is descending to the disc (Down switch is on (L)).

In each case, H is applied to base of X105, making it conduct. The gate of FETX106 goes low and error signal is not conveyed to IC102.

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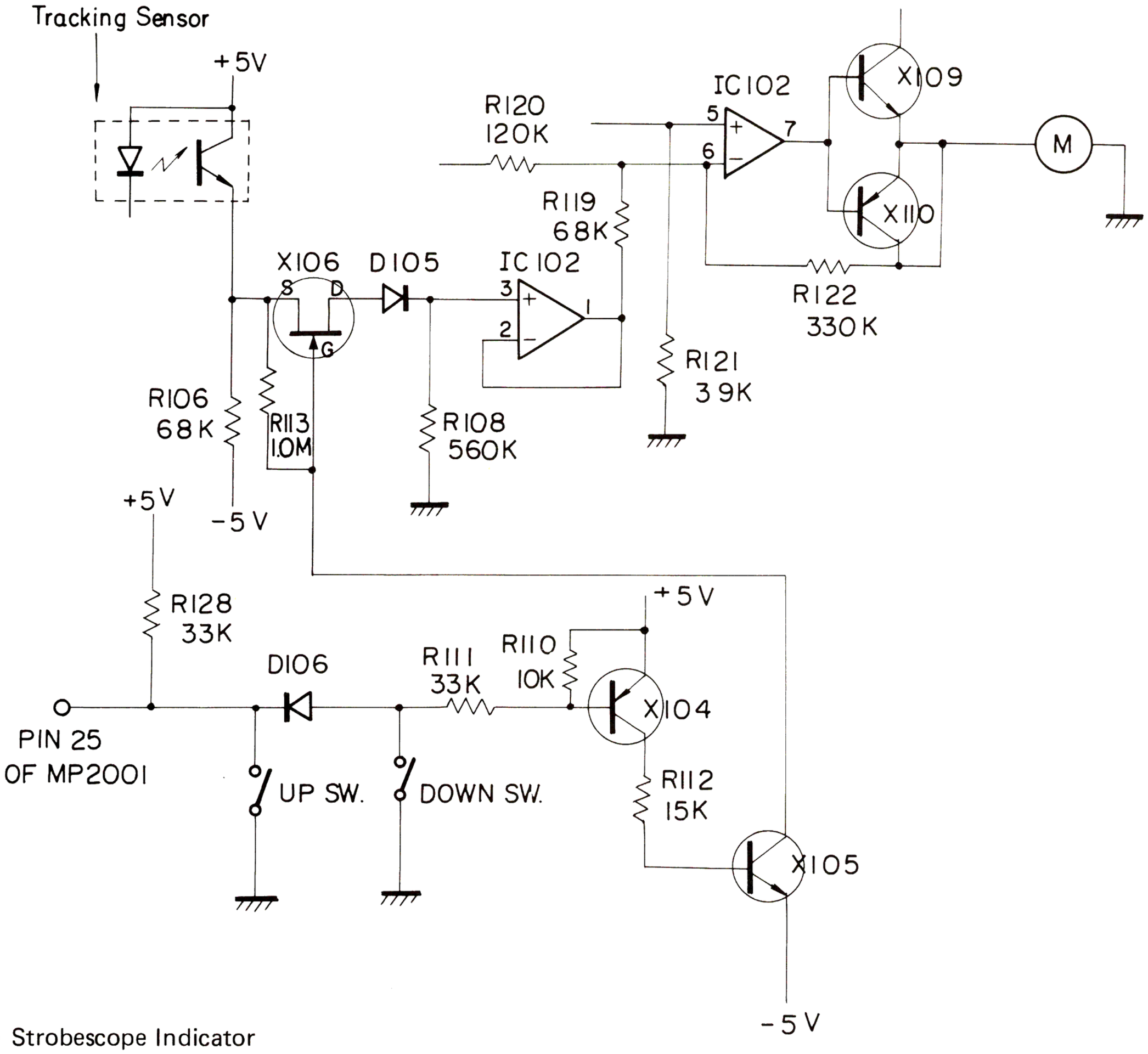
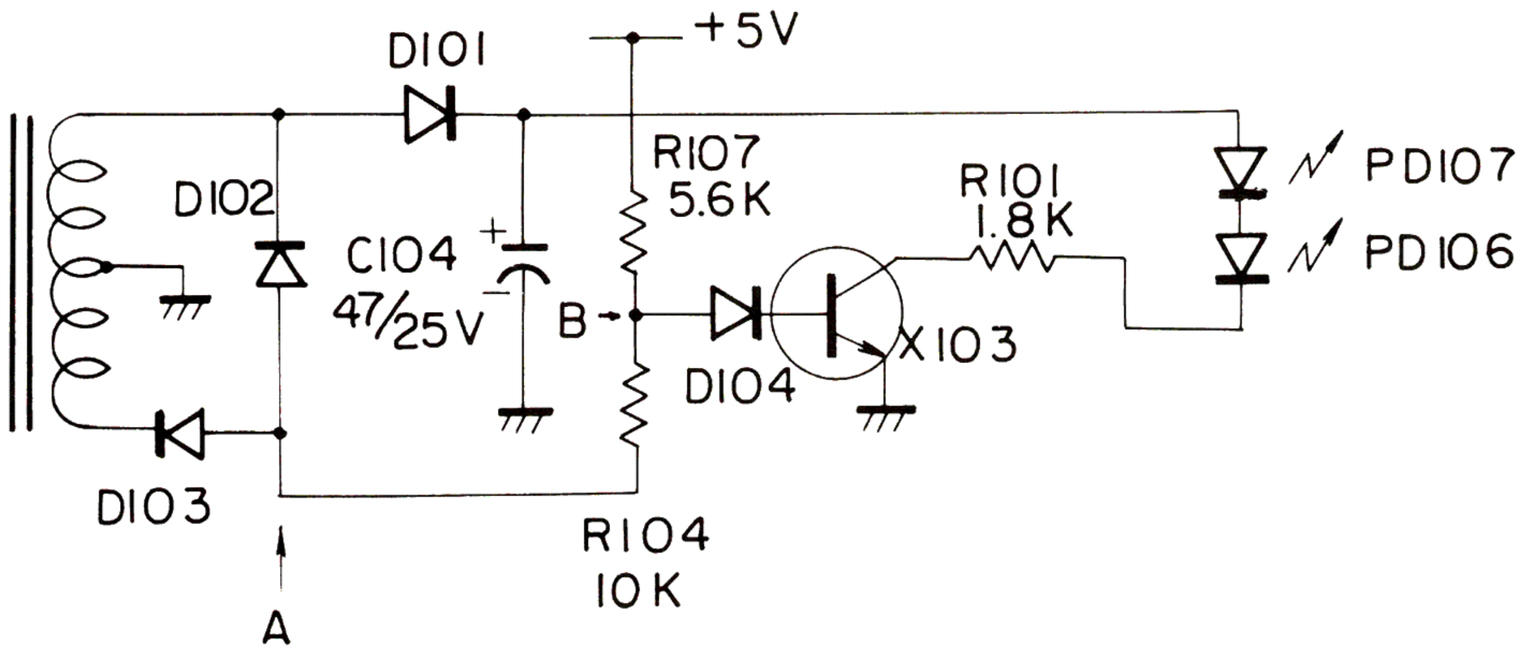


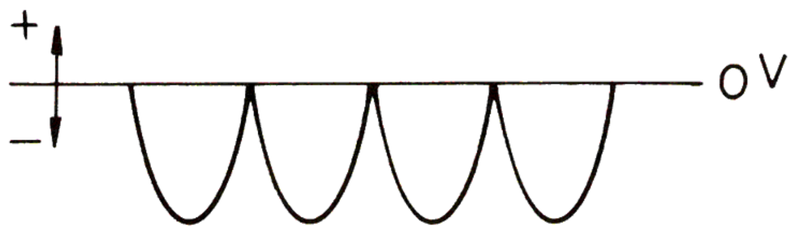
(16) Strobescope Indicator

Makes LED flash.

Waveforms at A point will be as follows:



Waveform at point A.



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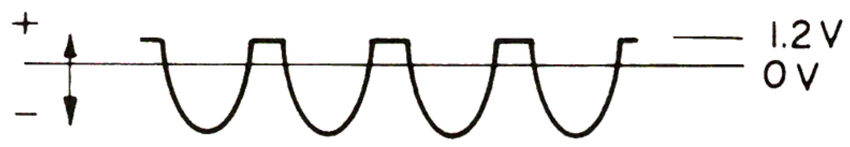
R104 and R107 divide the voltage applied across these. And the voltage at point B will be:

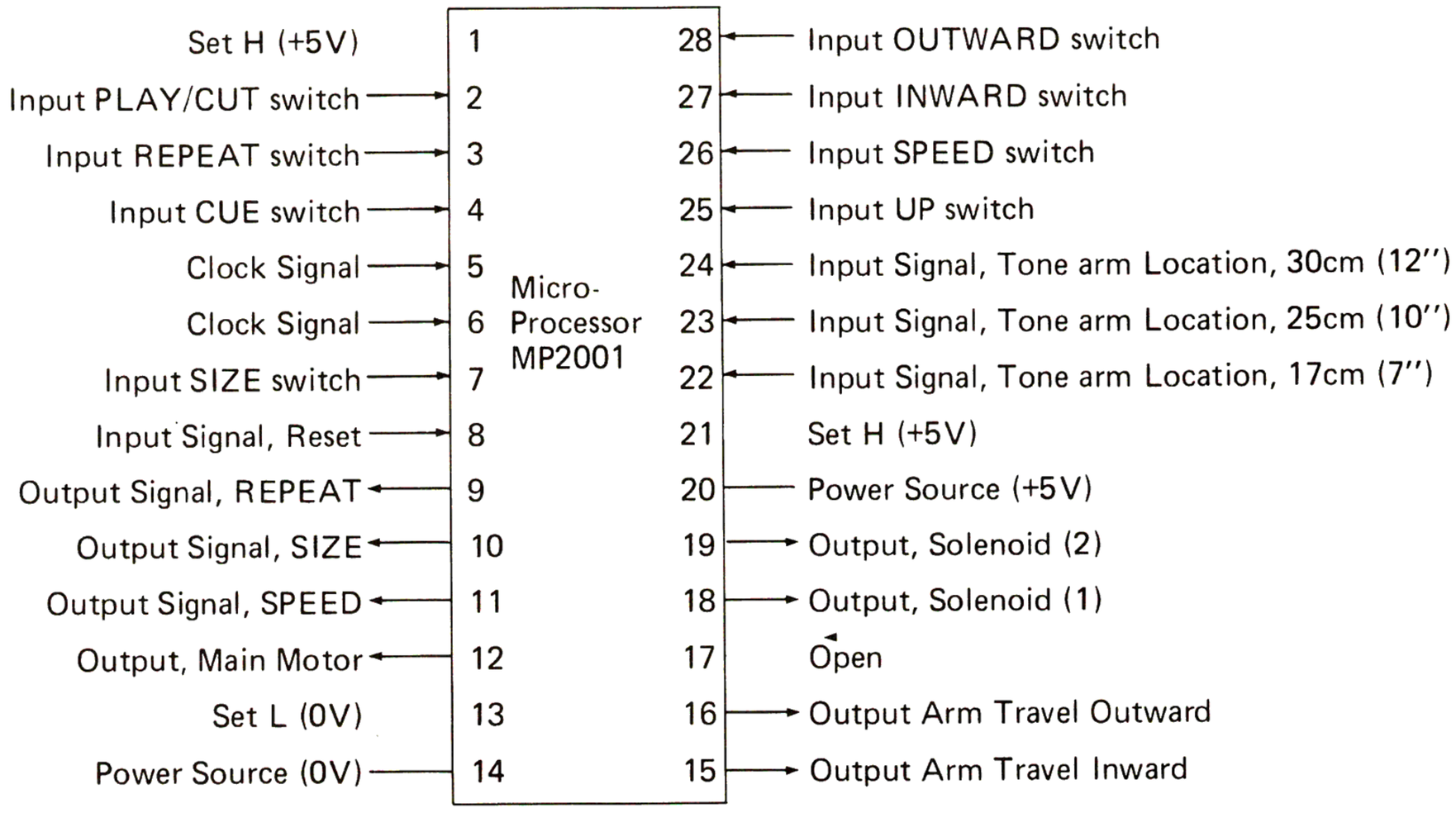
Waveform at point B.



When the voltage at B exceeds 1.2V, X101 turns on and lights LEDs. LEDs light up the stroboscope under the turntable platter, and reflect in the stroboscope mirror.

(17) Microprocessor

1. Pin Location:


Set H (+5V) 1
Input PLAY/CUT switch 2
Input REPEAT switch 3
Input CUE switch 4
Clock Signal 5
Clock Signal 6
Input SIZE switch 7
Input Signal, Reset 8
Output Signal, REPEAT 9
Output Signal, SIZE 10
Output Signal, SPEED 11
Output, Main Motor 12
Set L (0V) 13
Power Source (0V) 14
Micro-Processor MP2001
28 Input OUTWARD switch
27 Input INWARD switch
26 Input SPEED switch
25 Input UP switch
24 Input Signal, Tone arm Location, 30cm (12")
23 Input Signal, Tone arm Location, 25cm (10")
22 Input Signal, Tone arm Location, 17cm (7")
21 Set H (+5V)
20 Power Source (+5V)
19 Output, Solenoid (2)
18 Output, Solenoid (1)
17 Open
16 Output Arm Travel Outward
15 Output Arm Travel Inward

All of the terminal are open drain.

2. Function of Pins:

1) No. 1 is optional pin, not used, and set at H (+5V).

2) Input, PLAY/CUT switching:

At initial mode, it is set at H (+5V).
At the rest position, 0V is accepted as a signal to start PLAY, and is also accepted as CUT signal at positions other than rest.

3) Input, REPEAT switching:

At initial mode, it is set at H (+5V).
L (0V) is accepted as REPEAT ON or REPEAT OFF signal by pressing repeat button.

4) Input, CUE switching:

At initial mode, it is set at H (+5V).
L (0V) is accepted as UP or DOWN signal by pressing CUE button.

5, 6) Clock:

Clock input signal of microprocessor and 400 kHz is oscillated by connection with capacitor and resistor.

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7) Input, SIZE switching:

At initial mode, it is set at H (+5V).
L (0V) is accepted as size signal of 30cm (12") or 17cm (7") by pressing size button.

8) Input Signal, RESET:

To recover all of the modes to the initial mode by L (0V) of input signal.
The initial mode means:

—Tone arm at the rest position.
—Turntable platter is stopped.
—Speed is set at 33 rpm.
—Size is set at 30cm (12").

9) Output Signal, REPEAT:

At initial mode, output becomes high impedance and turns REPEAT off.
To feed L (0V) signal to REPEAT on press repeat button.

10) Output Signal, SIZE:

At initial mode, output becomes high impedance and sets the size to 30cm (12").
To feed L (0V) signal to set size to 17cm (7"), pressing the size button.

11) Output signal, Rotary Speed:

At initial mode, level of signal is L (0V) for 33 rpm. It becomes high impedance for 45 rpm by pressing speed button.

12) Output, Main Motor ON/OFF:

At initial mode, it becomes high impedance to turn off main motor.
Signal becomes L (0V) to turn main motor on when play button is pressed or when tone arm is located at other than rest position.

13) No. 13 is optional pin, not used and set at L (0V).

14) Power Source (0V):

Set at 0V.

15) Output, Arm Travel Inward:

L (0V) level for normal playback condition. It becomes high impedance for inward travel.

16) Output, Arm Travel Outward:

L (0V) level for normal playback condition. It becomes high impedance for outward travel.

17) No. 17 is optional pin, not used; leave it open.

18) Output, Solenoid (1):

L (0V) at tone arm UP position. It becomes high impedance at tone arm DOWN position.

19) Output, Solenoid (2):

L (0V) at tone arm UP position. It becomes high impedance for 2 seconds when tone arm is in DOWN position.

20) Power Source (+):

Set at +5V.

21) No. 21 is optional pin, and not used; set at H (+5V).

22, 23, 24) Input Signal, Tone arm Location:

Same functions as (10) Detecting Arm Location, Paragraph of Principle of Operation for Control Circuit.

25) Input, UP switching:

At initial mode, it is set at H (+5V).
L (0V) is accepted as tone arm UP and DOWN signal alternately.

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26) Input, SPEED switching:

At initial mode, it is set at H (+5V).
L (0V) is accepted as signal to change rotary speed of main motor (33/45) by pressing the speed button.

27) Input, Inward Travel switching:

At initial mode, it is set at H (+5V).
L (0V) is accepted as signal to travel inward, and tone arm continues to travel when the button is pressed.

28) Input, Outward Travel switching:

At initial mode, it is set at H (+5V).
L (0V) is accepted as signal to travel outward, and tone arm continues to travel when the button is pressed.

EXPLANATION OF AUTOMATIC MECHANISM

1. Automatic Start

(1) Power Switch ON

a. When voltage of power source reaches standard operating voltage, reset signal is applied to pin No. 8 of MP2001 (microprocessor).
b. With reset signal, MP2001 initiates the signal to set rotary speed (at pin No. 11) and tone arm position (at pin No. 22-24) as initial status.
   Initial status
   Tone arm: At rest position
   Rotary speed: 33—1/3 rpm.
c. If tone arm is positioned at other than the rest position, MP2001 initiates outward travel signal at pin No. 16 to drive sub-motor so the motor drives tone arm back to the rest position.

(2) Play (Automatic Start)

a. By pressing Play/Cut button, switch 107 turns on and play signal is applied to pin No. 2 of MP2001. (The signal works as play signal when tone arm is at rest position, but works as cut signal at other positions.)
b. With play signal, MP2001 initiates inward travel signal at pin No. 15 to drive sub-motor so the motor drives tone arm to lead-in position in accordance with size signal.
c. Lead-in position is detected by light signal which is applied to pin No. 22-24 of MP2001 through position sensor (PX101-103).
d. After tone arm stops at lead-in position, tone arm descends by pulling solenoid, which is energized by solenoid signal from pin No. 18-19 of MP2001.

Position Sensor Ass'y

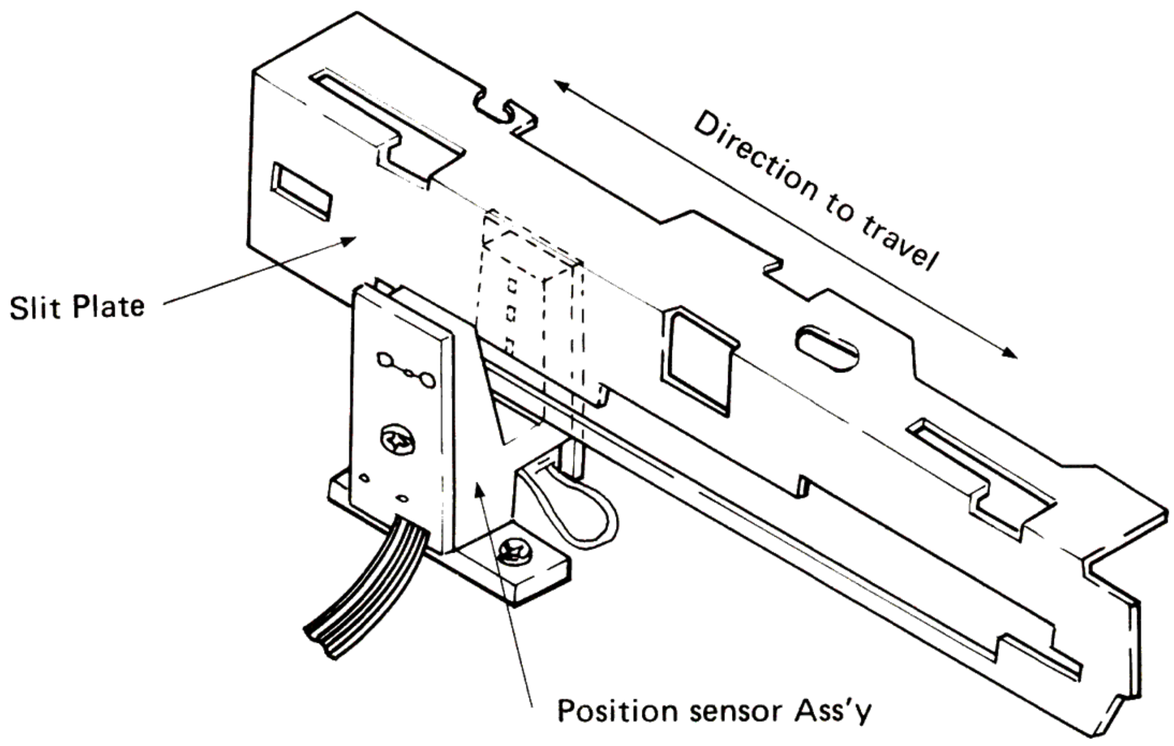

Fig. 15

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(3) Automatic Return

a. When tone arm comes to return position, return signal is generated by position sensor as the light falls on the photo transistors (PX101-103).
b. By return signal applied to MP2001 (pin No. 22-24) from position sensor, solenoid signal from MP2001 goes off and disenergizes the solenoid so the tone arm goes up.
c. After completion of lift-up motion of tone arm MP2001 generates outward travel signal to drive sub-motor so the motor drives tone arm back to rest position.

(4) Repeat Play

a. By pressing repeat button, switch 106 turns on and repeat signal is applied to pin No. 3 of MP2001.
b. Repeat signal from MP2001 (pin No. 9) will be reversed as H or L whenever repeat button is pressed.
c. When the end of disc is reached, the tone arm returns to rest position as described in (3) Automatic return.
d. After tone arm stops rest position disc, inward travel signal from MP2001 (pin No. 15) drives sob-motor to move tone arm at lead-in position.
e. When tone arm reaches lead-in position, solenoid signal from MP2001 (pin No. 18-19) energizes solenoid to descend tone arm.

(5) Automatic Cut

a. By pressing Play/Cut button, switch 107 turns on and cut signal is applied to MP2001 (pin No. 2). (When tone arm is at rest position, the signal works as play signal.)
b. By cut signal, MP2001 interrupts solenoid signal to lift tone arm.
c. When tone arm reaches up position, outward travel signal from MP2001 (pin No. 16) drives sub-motor to move tone arm back to rest position.
d. When cut signal is applied, repeat signal from MP2001 (pin No. 9) becomes H (OFF) automatically.

(6) Cueing

a. By pressing cue button, switch 105 turns on and cueing signal is applied to pin No. 4 of MP2001.
b. When tone arm is in up position, by cueing signal, solenoid signal from MP2001 (pin No. 18-19) energizes solenoid to descend the tone arm.
c. When tone arm is in down position, by cueing signal, solenoid signal from MP2001 is disengaged so the solenoid is disenergized to lift the tone arm.
d. When tone arm is at rest position, cueing signal is disregarded.

(7) Manual Search

a. By pressing outward travel button, switch 104 turns on. By pressing inward travel button, switch 103 turns on. In either mode, either signal will be applied to MP2001.
b. When tone arm is down, by pressing the button, cueing signal is applied to MP2001 to lift tone arm.
c. When tone arm is up, by pressing the button, the travel signal is applied to sub-motor directly, by-passing MP2001, to drive tone arm in either direction.

(8) Speed Selection

a. By pressing speed button, switch 101 turns on and speed change-over signal is applied to pin No. 26 of MP2001.
b. Whenever the speed change button is pressed, speed signal from pin No. 11 of MP2001 is altered H or L so to change-over motor speed and LED accordingly.

(9) Size Selector

a. By pressing size button, switch 102 turns on and size change-over signal is applied to pin No. 10 of MP2001.
b. Whenever the size change button is pressed, size signal from pin No. 10 of MP2001 is altered H or L so to change-over record size and LED accordingly.

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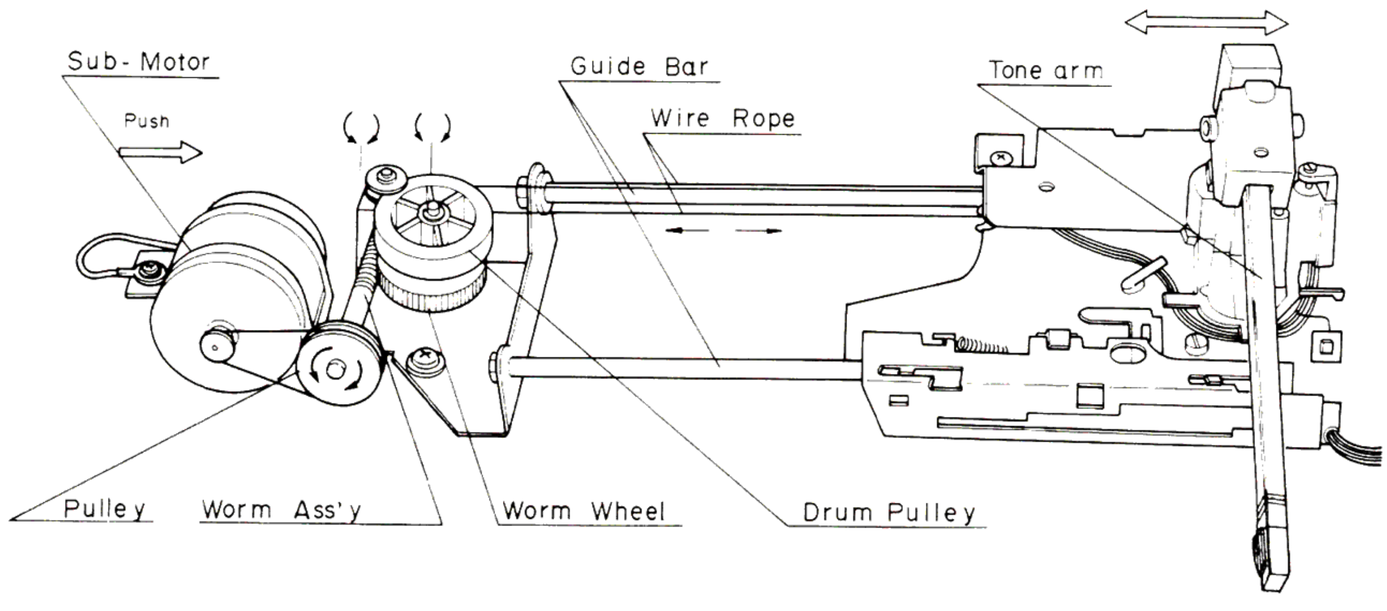

Figure 16

When ◀◀ button pressed;

1. Sub-motor begins to rotate clockwise.
2. Pulley rotates clockwise.
3. Worm ass'y rotates clockwise.
4. Drum Pulley and worm wheel rotate clockwise.
5. Wire rope rotates clockwise.
6. The tone arm moves to the left.

When ▶▶ button pressed;

1. Sub-motor begins to rotate counter-clockwise.
2. Pulley rotates counter-clockwise.
3. Worm ass'y rotates counter-clockwise.
4. Wire rope moves counter-clockwise.
5. The tone arm moves to the right.

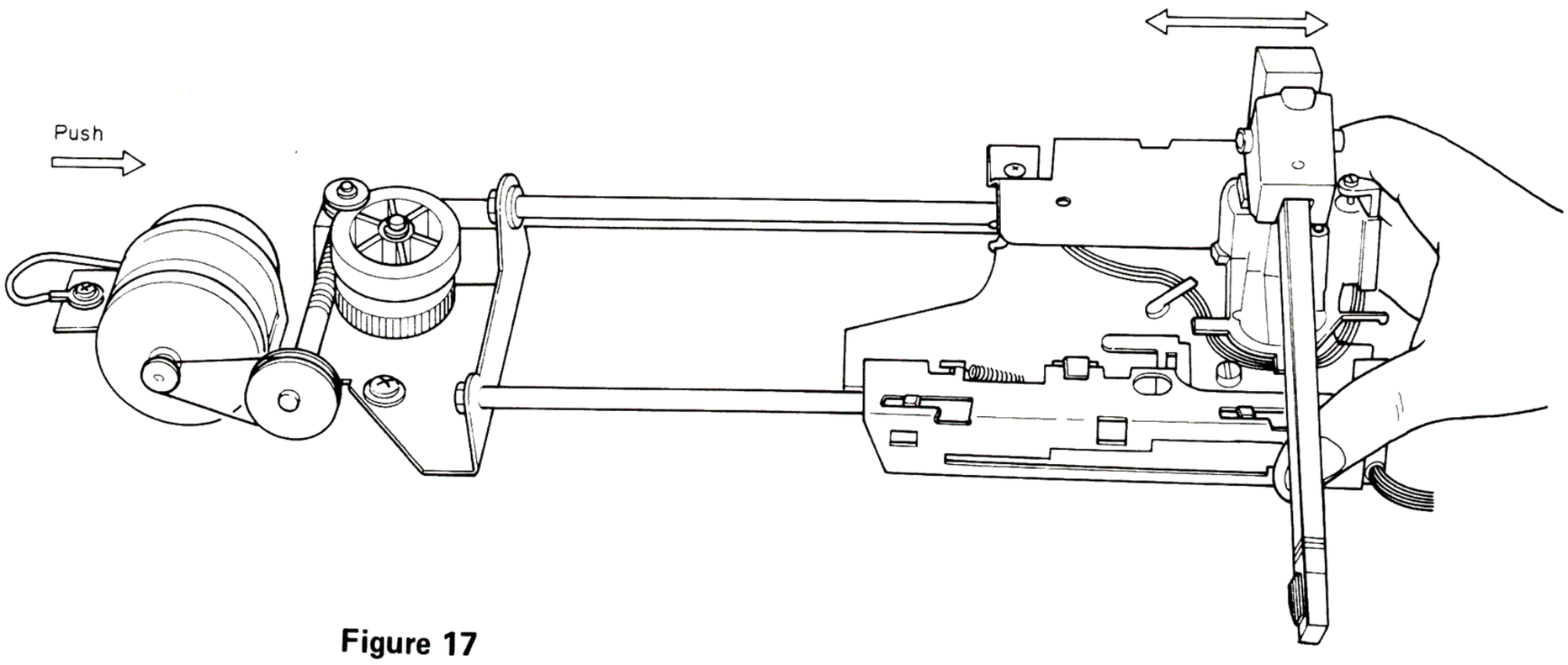

Figure 17

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TROUBLESHOOTING GUIDE

Symptom	Cause	Procedure
Power a) Power LED does not turn ON.	a) 1. Power transformer is defective.	a) 1. Check the voltage between terminals 3 and 5 of CNP 101. If 23V AC is not observed, replace transformer.
	2. Fuses have blown.	2. Check fuses 102 and 103. Replace fuse(s).
	3. LED PD105 is defective.	3. Check voltage between terminals 3 and 4 of JL102. If 5V DC is observed, replace LED.
	4. Diode ZD101 is defective.	4. Check the voltage between both terminals of ZD101. If 5.6V DC is not observed, replace diode.
	5. Transistor X101 is defective, or Diode BD101 is defective.	5. Check the voltage at collector of X101. If 15V DC is observed, replace transistor; if other than 15V DC, replace diode.
b) LEDs PD106, PD107 for strobe do not turn ON.	b) 1. Power transformer is defective.	b) 1. Check as specified in item 1 above. Replace transformer.
	2. Fuses has blown.	2. Check as specified in item 2 above. Replace fuse(s).
	3. Diode D101 is defective.	3. Check the voltage between terminals TP104 and 2 of JL 105. If DC voltage is not observed, replace diode.
	4. LEDs PD106, PD107 are defective, or Transistor X103 is defective.	4. Check the voltage between both terminals of both LEDs. If pulse voltage is observed, replace LEDs; if it is not observed, replace transistor X 103.

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Symptom	Cause	Procedure
Play/Cut		
a) Tone arm does not move.	a) 1. Position sensor ass'y is defective.	a) 1. Check voltage between the following points. TP104 and 4 of JL106 should be 5V. TP104 and 3 of JL106 should be −4V. TP104 and 2 of JL106 should be −4V. TP104 and 5 of JL106 should be 3.8V. If any of the voltages are not observed, replace position sensor ass'y.
	2. Sub-motor is defective.	2. Check voltage between terminals 6 and 7 of CNPp02 If 10V DC is observed, replace Sub Motor.
	3. Transistor X109, X110 are defective.	3. Check voltage between base and emiter of transistors X109 and X110. If 0.6V DC is not observed, replace transistor(s).
	4. IC102 is defective.	4. Check voltage between terminals TP104 and 15 of IC101. If 5V DC is observed, replace IC102.
	5. Play/Cut Switch is defective.	5. Check voltage between terminals TP104 and 2 of IC101 while pushing Play/Cut switch. If 0V DC is observed, replace IC101. If other than 0V DC, replace switch.
	6. Movement of linear tracking carrier mechanism is stiff.	6. While pushing pulley holding plate ass'y to release tension of wire belt, check carrier mechanism (see Fig. 16) for smoothness of movement. Check routing for lead wire interference with carrier mechanism movement. Check guide bar. Replace if deformed, dented, nicked.
b) Tone arm returns to rest position during lead-in motion.	b) 1. Position sensor ass'y is defective.	b) 1. Check as specified in item a) 1.

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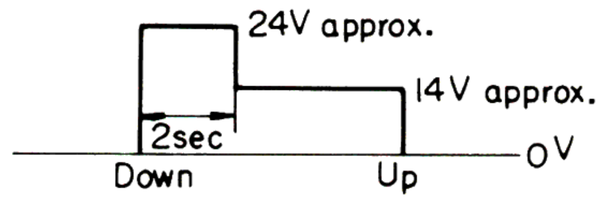
Symptom	Cause	Procedure
Play/Cut (continued) b) Tone arm returns to rest position during lead-in motion (continued).	b) 2. Improper adjustment of tracking sensor.	b) 2. Place tone arm on its rest, and check voltage between terminals TP104 and TP101. Voltage should be 0 ± 0.6V; if not, adjust position of tracking sensor ass'y.
	3. Movement of linear tracking carrier mechanism is stiff.	3. Check as specified in item a) 6.
c) Tone arm does not descend to disc.	c) 1. Leaf switch (UP SW1) is defective.	c) 1. Contacts of leaf switch (UP SW1) should be closed when power switch (SW201) is off and tone arm is UP. Check voltage between terminals TP104 and 11 of CNP 103; voltage should be 0V; if +5V is observed, contacts of leaf switch are not closed, proceed with adjustment described in lifter mechanism replacement instructions (page 9, step 4).
	2. Solenoid is defective.	2. Press Play/Cut switch (SW-107) on while monitoring voltage between 13 and 14 of CNP103. As tone arm descends, voltage should change from 24V, after 2 sec, to 14V (approx.) and voltage should remain at 14V during disc play (cue down). When tone arm is at rest position (Cue UP), voltage should be 0V. 
	3. Improper solenoid stroke adjustment.	3. Adjust stroke of solenoid as described in lifter mechaism replacement instructions (page 9 step 4-2).

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Symptom	Cause	Procedure
Play/Cut (continued) c) Tone arm does not descend to disc (continued).	c) 4. Improper adjustment of clearance between elevation lever and elevation spindle.	c) 4. Re-install elevation lever as described in tone arm replacement instructions (page 7, step 1) so the proper clearance between elevation lever and elevation spindle is obtained.
Repeat Repeat LED does not turn ON.	1. LED (PD109) is defective.	1. Check voltage between terminals 7 and 8 of JL101; if voltage changes by pushing repeat switch, replace LED.
Horizontal Horizontal movement is intermittent or non-existent.	1. Sub-motor is defective.	1. Check voltage between terminals 6 and 7 of CNP102 while pushing manual search switch. Voltage readings will be determined by speed and direction of tone arm movement selected (in relation to Main Motor shaft). Inward: More than −7V Outward: More than +8V If sub-motor does not rotate even when above voltages are observed, replace sub-motor.
	2. Adjustment of tracking sensor ass'y is not accurate.	2. Check as specified in item b) 2 of Play/Cut.
	3. Transistors X109, X110 are defective.	3. Check as specified in item a) 3 of Play/Cut.

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Symptom	Cause	Procedure
Horizontal (continued) Horizontal movement is intermittent or non-existent (continued).	4. IC102 is defective.	4. Check voltage between terminals TP104 and TP102 or TP103 while pushing manual search switch. Inward: TP104–TP102: 2.3V Outward: TP104–TP103: 0.7V If above voltages are observed, replace IC102.
	5. Manual search switch.	5. Check voltage between terminals TP104 and 4 or 5 of JL101 while pushing manual search switch. Inward: TP104–5: 0V Outward: TP104–4: 0V If above voltages are not observed while pushing manual search switch, replace switch.
Size a. Record size selector does not function.	SW102 or IC101 is defective.	Check output level of pin 7 of IC101. Replace SW102 if "L" signal is not observed. If "L" signal is observed at pin 7 of IC101, check signal level at pins 2, 3, 4, 26, 27 and 28 of IC101. Replace IC101 if any "L" signal is observed at one of the above pins.
b. Size select indicators (LED) do not turn ON.	Transistor X115 or X118 is defective. Or PD103 or PD104 is defective.	Check function of PD103. Replace X118 if PD103 turns on/off when size button is pressed. Replace X115 if PD103 does not turn on/off when size button is pressed. Other than the above, replace PD103 or 104.

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Symptom	Cause	Procedure
Speed		
a. Platter speed and indicator can not be switched.	SW101 or IC101 is defective.	Check signal at pin 26 of IC101. Replace SW101 if "L" signal is not observed. If "L" signal is observed at pin 26 of IC101, check pins 2, 3, 4, 7, 27 and 28 of IC101. Replace IC101 if "L" signal is observed at one of the above pins.
b. Platter speed can be switched but LED can not be switched.	X116 or X117 is defective.	Check function of PD102. Replace X117 if PD102 turns on/off when speed change button is pressed. Replace X116 if PD102 does not turn on/off.
c. LED can be switched but platter speed can not be switched.	D111 or X112 is defective.	Check output level at base of X112. Replace X112 if the output is altered 0V and 0.7V when speed change button is pressed. Replace D111 if the output is not altered when speed change button is pressed.
Other defects		
1. LED lights dimly.	1. LED is bent.	1. Straighten by hand.
2. Strobe is dimly lit when on.	2. Fuse 102 has blown.	2. Replace.
3. Horizontal movement control button is jamming. ◀◀ or ▶▶	3. Button touches edge of opening in plastic base.	3. Adjust installation of button and check clearance between the opening and both sides of button (should be 1mm).

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Symptom	Cause	Procedure
Other defects (continued)		
4. No output from cartridge only. L and R channel reversed.	4. Cartridge is defective. Improper connection of lead wires.	4. Replace the cartridge ass'y.
5. Strange sound when cartridge descends.	5. Amount of silicon oil on solenoid shaft is not enough.	5. Put silicon oil on solenoid shaft.
6. Strange sound from main motor.	6. Foreign matter stuck on motor magnet.	6. Remove.
7. Stylus cannot touch disc with cue down.	7. Stylus height is set too high.	7. Adjust stylus height as described in "Adjustment of Stylus height."
8. Stylus bounces on disc after tone arm descends.	8. Improper vertical movement of elevation plate (Ref. No. 33).	8. Replace elevation plate.
9. Tone arm base moves left or right after tone arm descends.	9. Improper adjustment of tracking sensor.	9. Check tracking sensor as described in item b) 2. of Play/Cut.
10. No Auto return.	10. Movement of linear tracking carrier is stiff.	10. Check movement of carrier mechanism as described in item a) 6 of Play/Cut.
11. Stylus scratches disc surface with cue up or during return to tone arm rest.	11. Slackness in elevation plate.	11. Replace elevation plate.
Motor		
a) Direct drive (main) motor does not rotate.	a) 1. Motor is defective.	a) 1. Disconnect terminal 5 of JL 104. If motor does not start rotation, replace motor.
	2. Transistor X111, X112 of main control circuit PCB is defective.	2. Check voltage between terminals TP104 and 12 of IC101. If 5V DC is observed, replace X111, X112.
	3. Position sensor ass'y or IC 101 is defective.	3. Check as specified in item b) 1. of Play/Cut. If position sensor ass'y is OK, replace IC101.
b) Direct drive motor does not rotate or speed is slow.	b) 1. Transformer or rectifying circuit is defective.	b) 1. Check voltage between 3 and 2 of CNP 1 of motor control circuit PCB. If 22V is not observed, replace transformer or Rectifying circuit.
	2. Hall element is defective.	2. Check waveform of base signal of X5, X6, X7 and X8. Waveform should be If not, hall element is defective; replace motor control circuit PCB.

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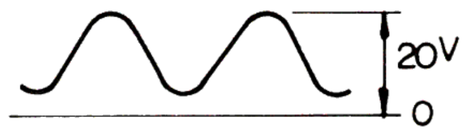
Symptom	Cause	Procedure
Motor (continued) b) Direct drive motor does not rotate or speed is slow (continued).	b) 3. Transistor X9, X10, X11, X12, or X5, X6, X7, X8 is defective.	b) 3. Check waveform of collector signal of X9, X10, X11, X12. Waveform should be  If above waveform is not observed, check transistors X5, X6, X7, X8, X9, X10, X11, and X12, and replace defective one.
c) Direct drive motor does not rotate.	c) 1. Direct drive motor is defective.	c) 1. Check resistance of motor winding wire. (between G and G, B and B) Infinite resistance: broken wire 0 resistance: shorted wire 105 ohm (approx): normal.
	2. IC 1 of motor control circuit PCB is defective.	2. Check voltage between terminals GND and 10 of IC 1. If 0.6V is not observed, replace IC 1.
d) Motor runs, but speed is high.	d) 1. Zener doide (ZD 1) is defective.	d) 1. Check voltage between terminals GND and 7 of IC 1. If voltage is 0, replace ZD1. If 13V DC is observed, it's normal.
	2. Semi-fixed resistor (VR1 or VR2) or external potentiometer is defective, or has improper wiring.	2. Disconnect lead wires between terminals 4 and 5 of CNP 1 of motor control circuit PCB; then reconnect 4 and 5. If motor speed cannot be adjusted by VR1 or VR2, replace defective one. Re-connect lead wires to terminals 4 and 5. If motor speed can be adjusted by external potentiometer, replace potentiometer, or check wiring of speed change switch.

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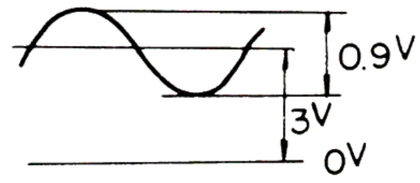
Symptom	Cause	Procedure
Motor (continued) d) Motor runs, but speed is high (continued).	d) 3. IC 1 is defective.	d) 3. Touch and release direct drive motor shaft with hand altermately while monitoring voltage between terminals GND and 10 of IC 1. If voltage does not fluctuate, replace IC 1.
	4. FG pattern is defective, or IC 1 is defective.	4. Check voltage between terminals GND and 3 of IC 1. Waveform should be  If this waveform is not observed, FG pattern or IC 1 is defective; replace IC 1 or direct drive motor control circuit PCB.
e) Motor speed change does not function.	e) Semi-fixed resistor (VR1 or VR2) or external potentiometer is defective, or improper wiring.	e) Check as specified in item d) 2 Motor.
f) Direct drive motor does not stop rotation after tone arm returns to the rest position.	f) 1. Direct drive motor is defective.	f) 1. Connect terminals TP104 and 5 of JL104 of main control circuit PCB. If motor does not stop rotation, replace motor ass'y.
	2. Transistor (X111 or X112) is defective.	2. Check voltage between terminals TP104 and 12 of IC 101 of main control circuit PCB. If 0V is observed, replace X111 or X112.
	3. Position sensor ass'y or IC 101 is defective.	3. Check as specified in item a) 1 of Play/Cut. If position sensor is not defective, replace IC101.

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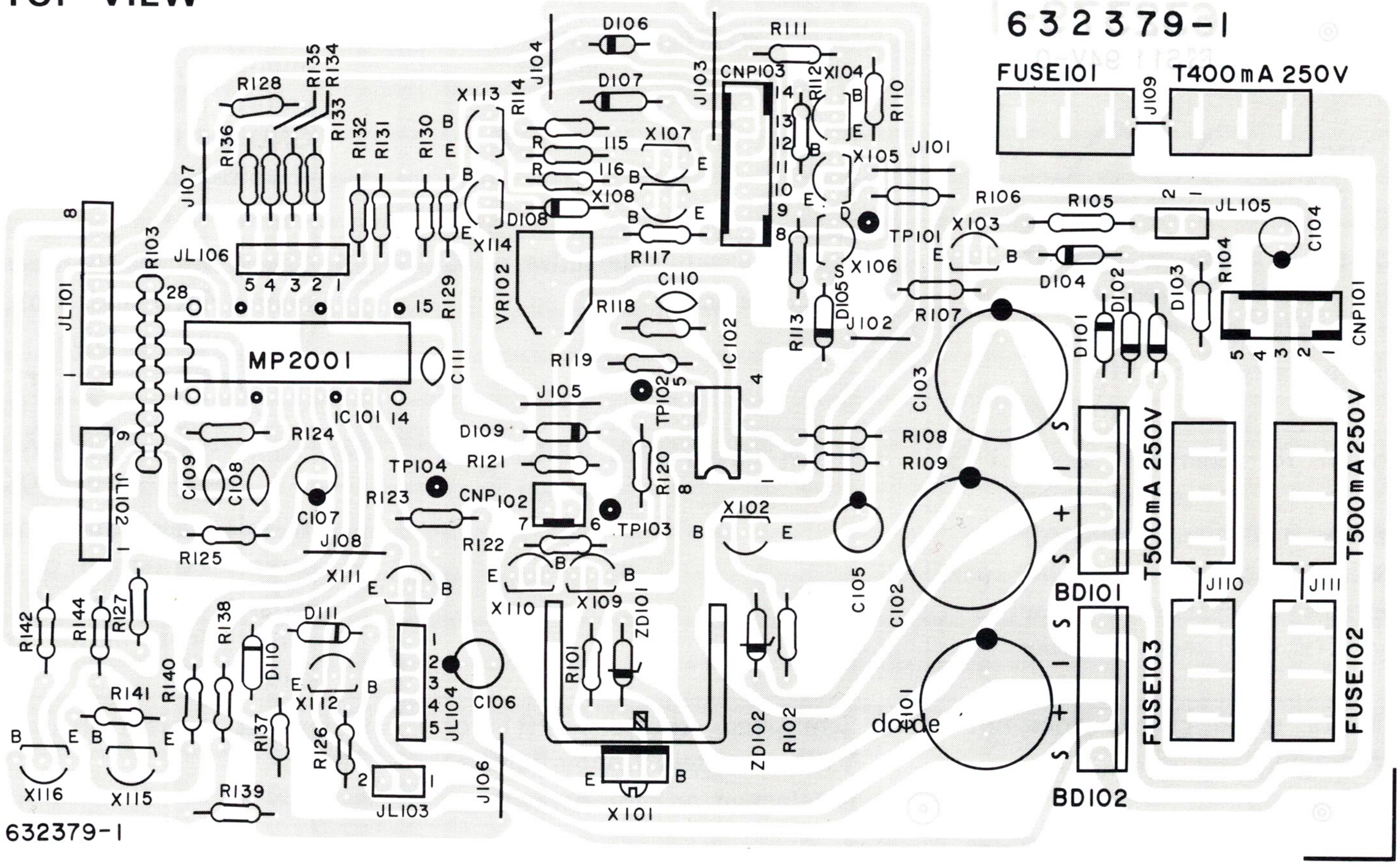
TOP/BOTTOM VIEWS OF P.C.BOARD AND WIRING

139-1 Main Contol P.C. Board

TOP VIEW

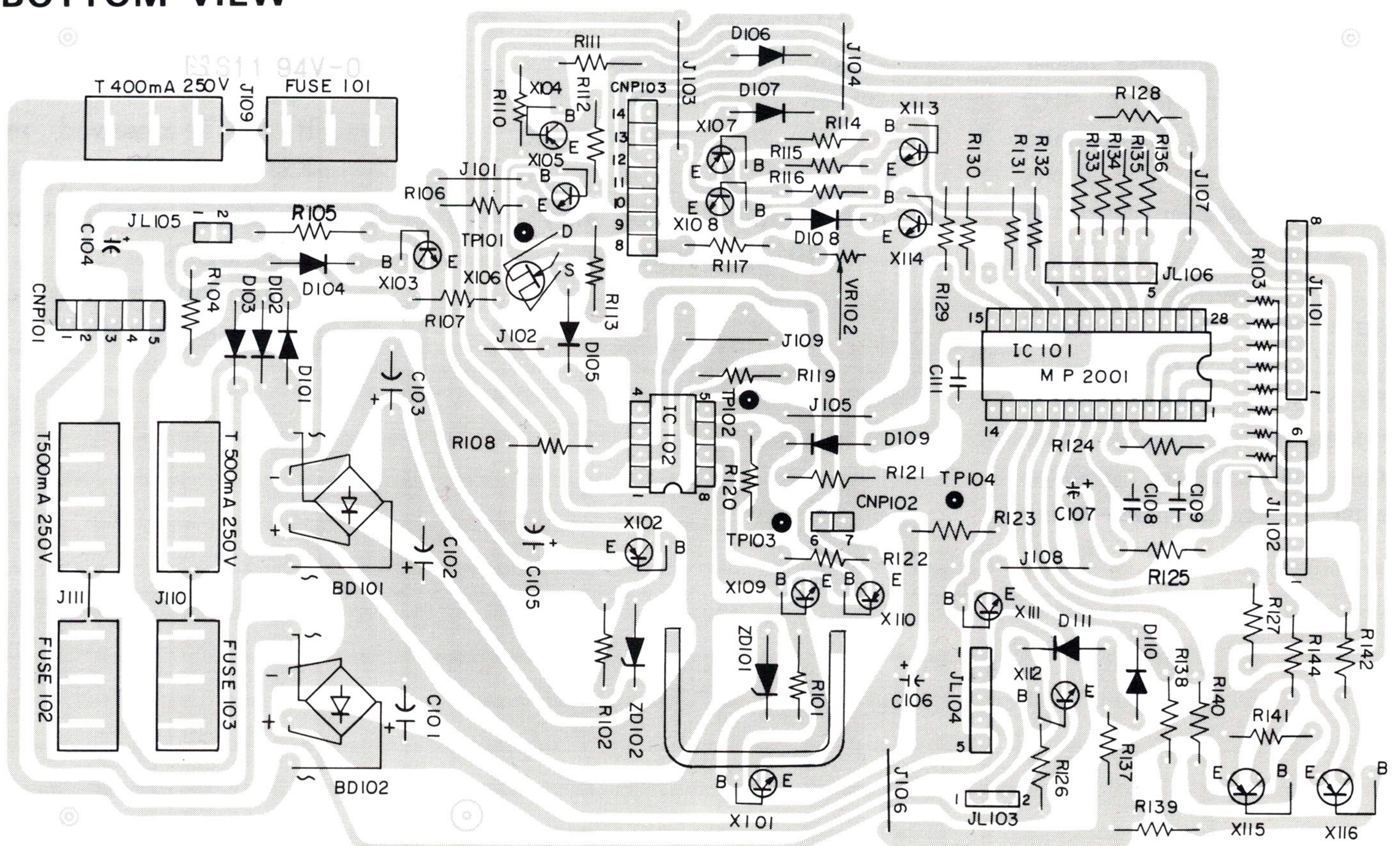


632379-1

NOTE: Although C110, R109 are printed on board, these are not used on actual products.

R118 is printed on board, however J109 is used instead of RN8 on actual products.

BOTTOM VIEW



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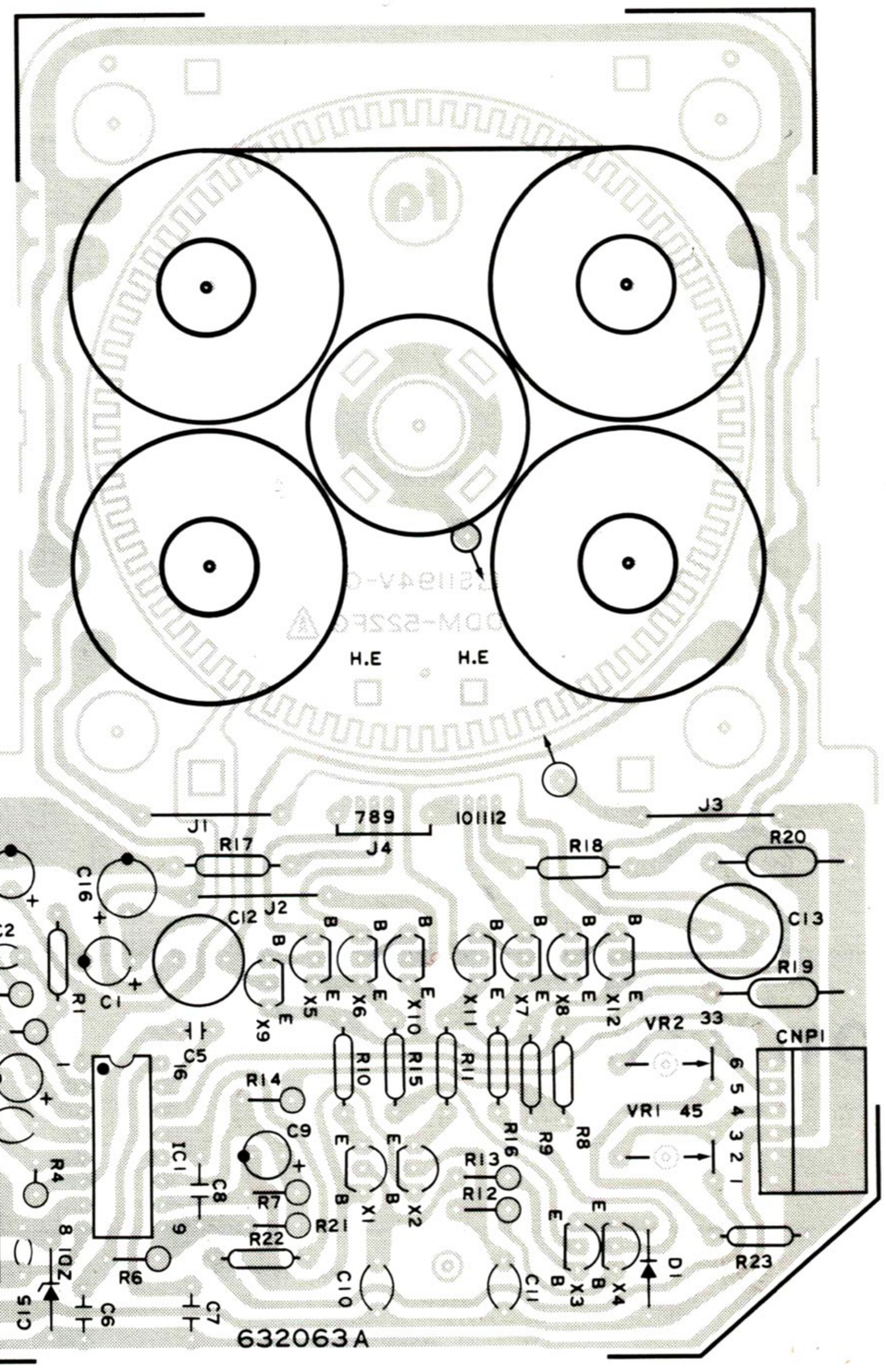
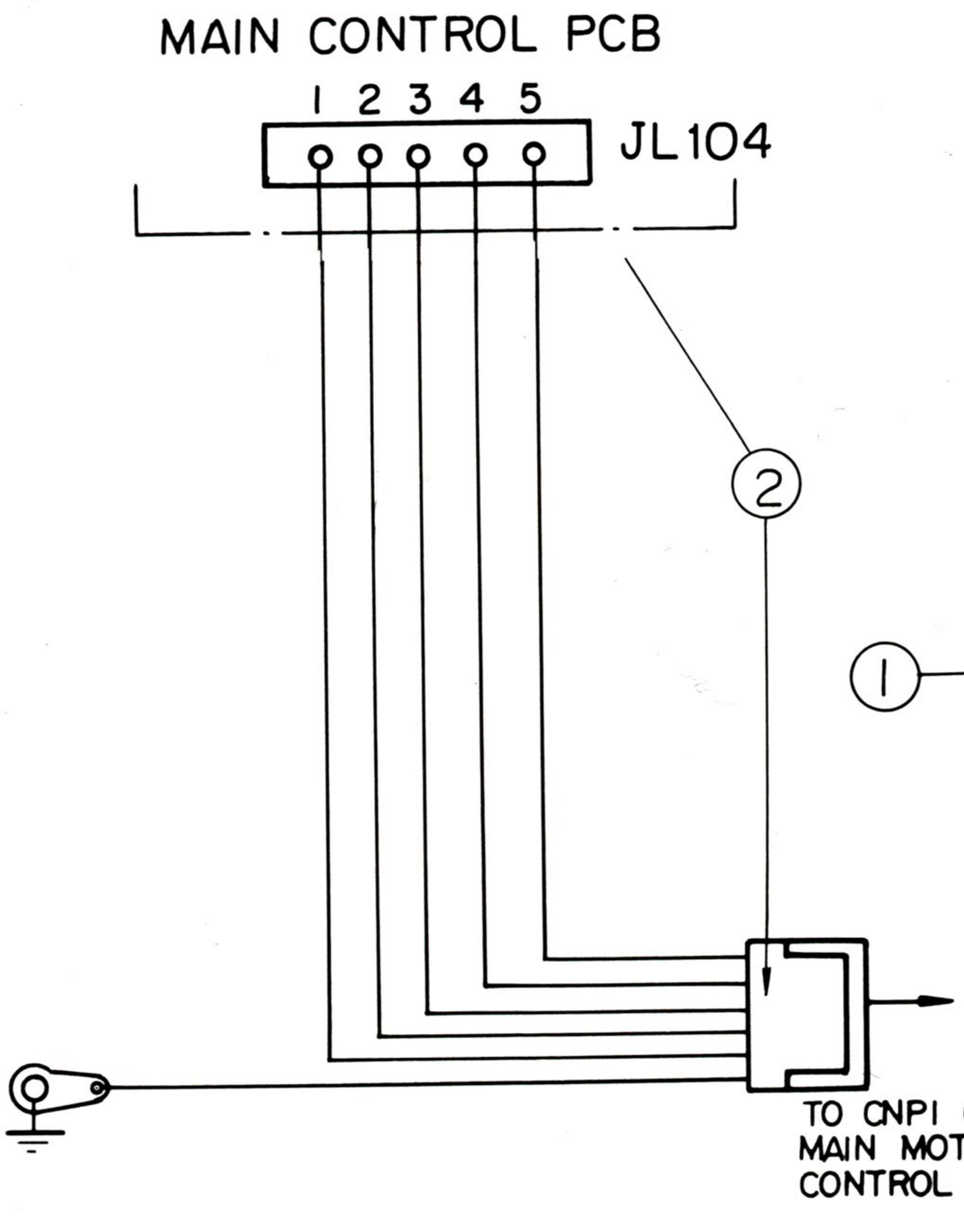
56. Main Motor Control P. C. Board

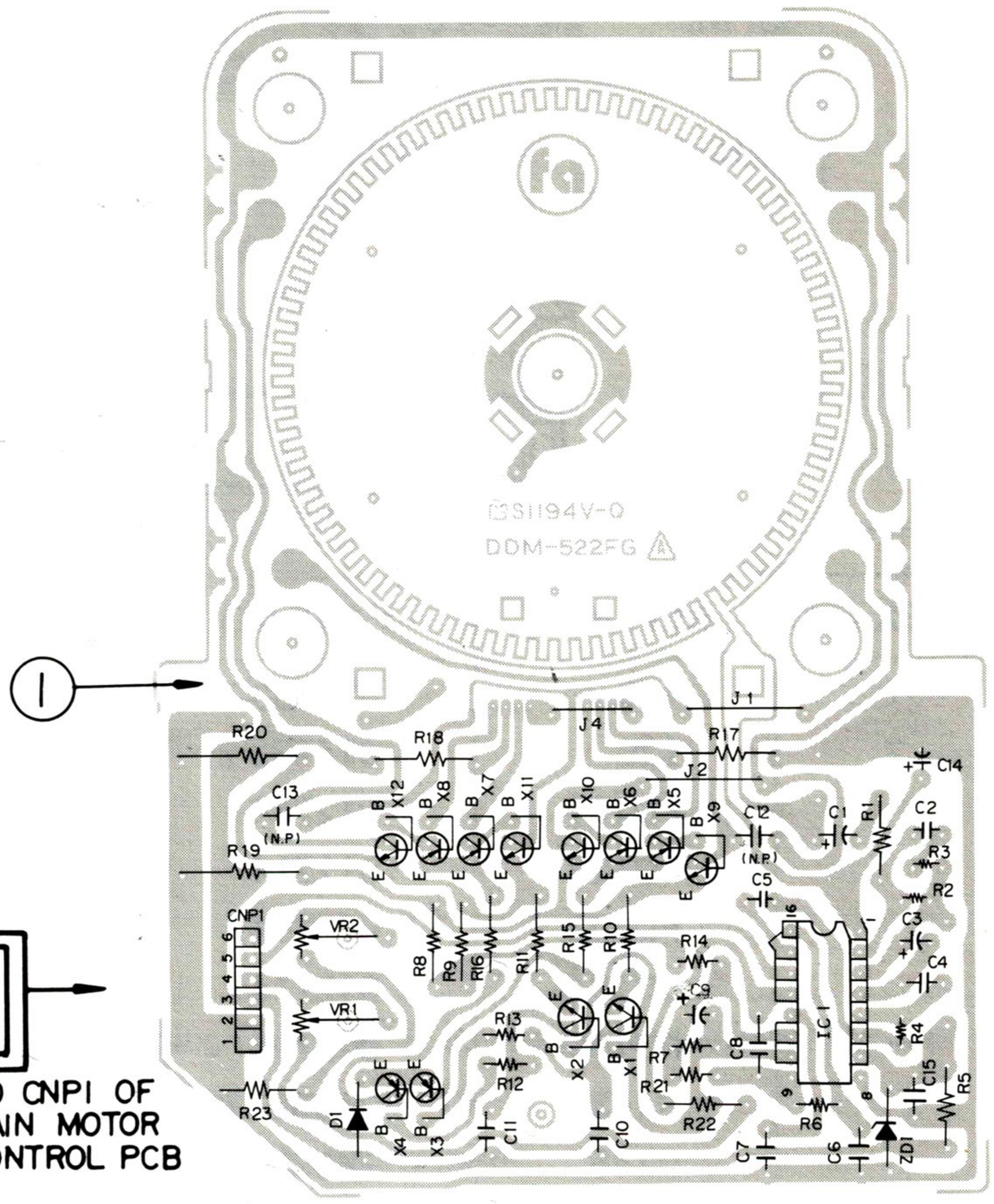
TOP VIEW



NOTE:
Although J3, TP1 and C16 are printed on board, these are not used on actual products.

BOTTOM VIEW





INDEX NO.	REF. NO.	PART NO.	DESCRIPTION
1	56	632171	Main Motor Control P.C.B. Ass'y
2	134	914446	Connector ass'y (2) (JL104)

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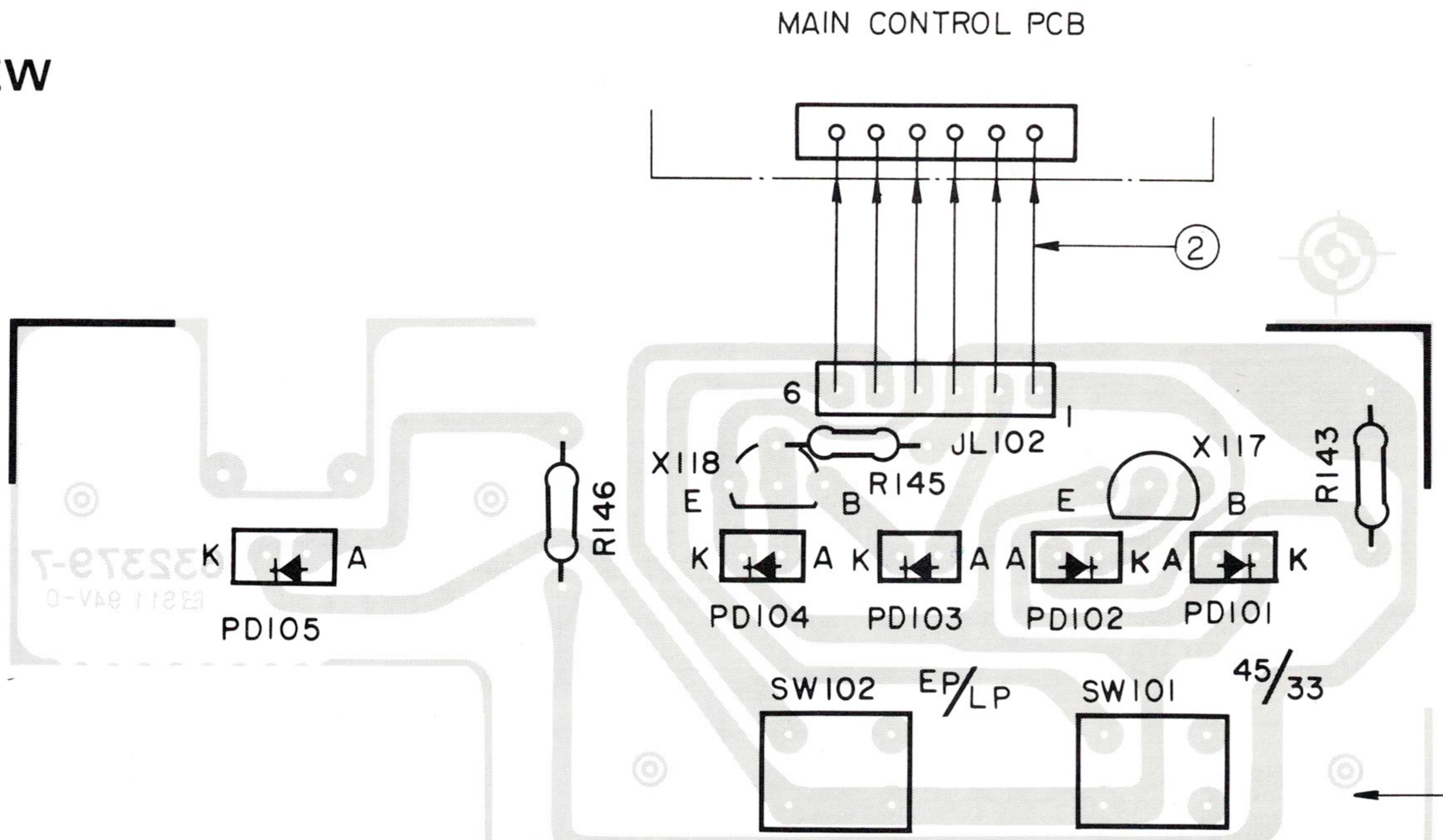
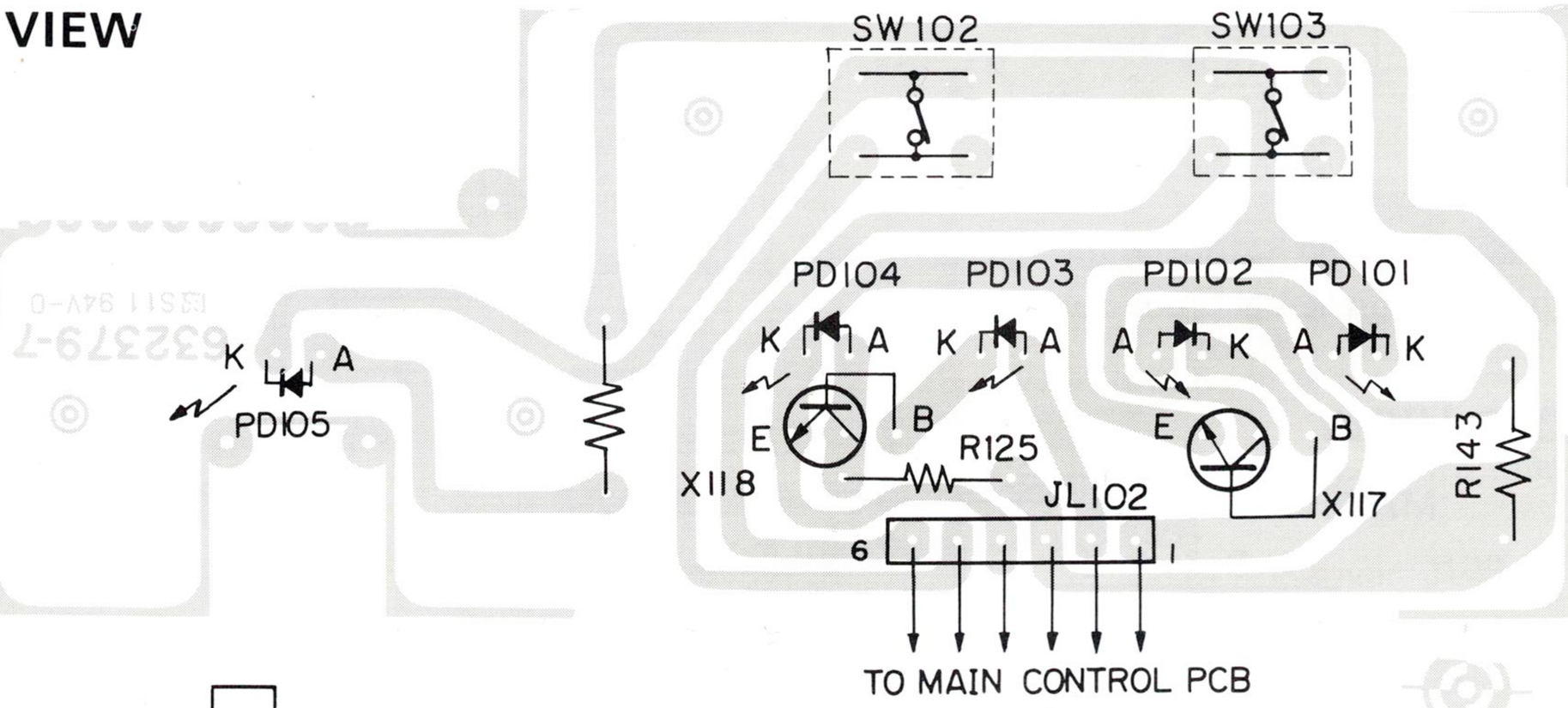
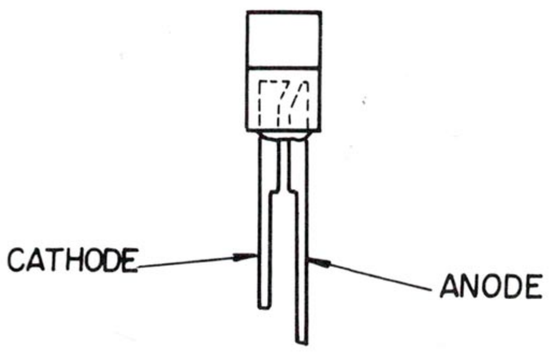
139-7 Speed/Size Switching Control P.C. Board

TOP VIEW



BOTTOM VIEW





INDEX NO.	REF. NO.	PART NO.	DESCRIPTION
1	139-7	632380-7	Switching Control P.C.B. Ass'y for Speed/Size
2	129	914433-2	Cable, Flat 6 cores (JL102)
	PD101	912714	LED, Yellow-Green, 45rpm indicator
	PD102	912714	LED, Yellow-Green, 33rpm indicator
	PD103	912714	LED, Yellow-Green, 7" size indicator
	PD104	912714	LED, Yellow-Green, 12" size indicator
	PD105	912713	LED, Red, Power indicator
	R143	Z4051132	390, 1/4W Carbon ±5%
	R145	Z4051132	390, 1/4W Carbon ±5%
	R146	Z4051133	470, 1/4W Carbon ±5%
	SW101	912595	Speed change-over switch
	SW102	912595	Record Size Selector switch
	X117-	Z4104103,2	Transistor, 2SC945(Q), (P)
	X118	or Z4104252,1	or 2SC1815(Y), (GR)
		912515-2	LED Spacer

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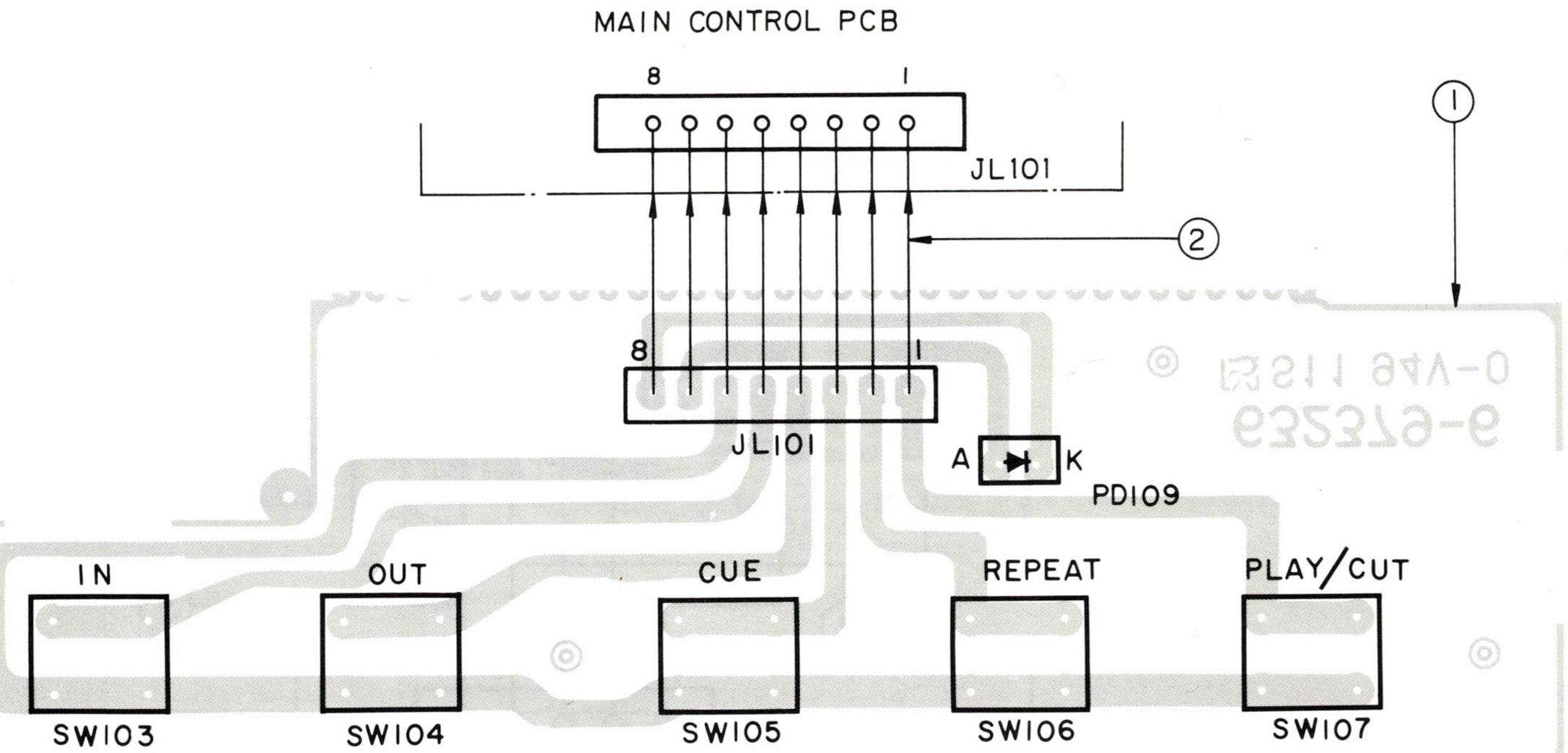
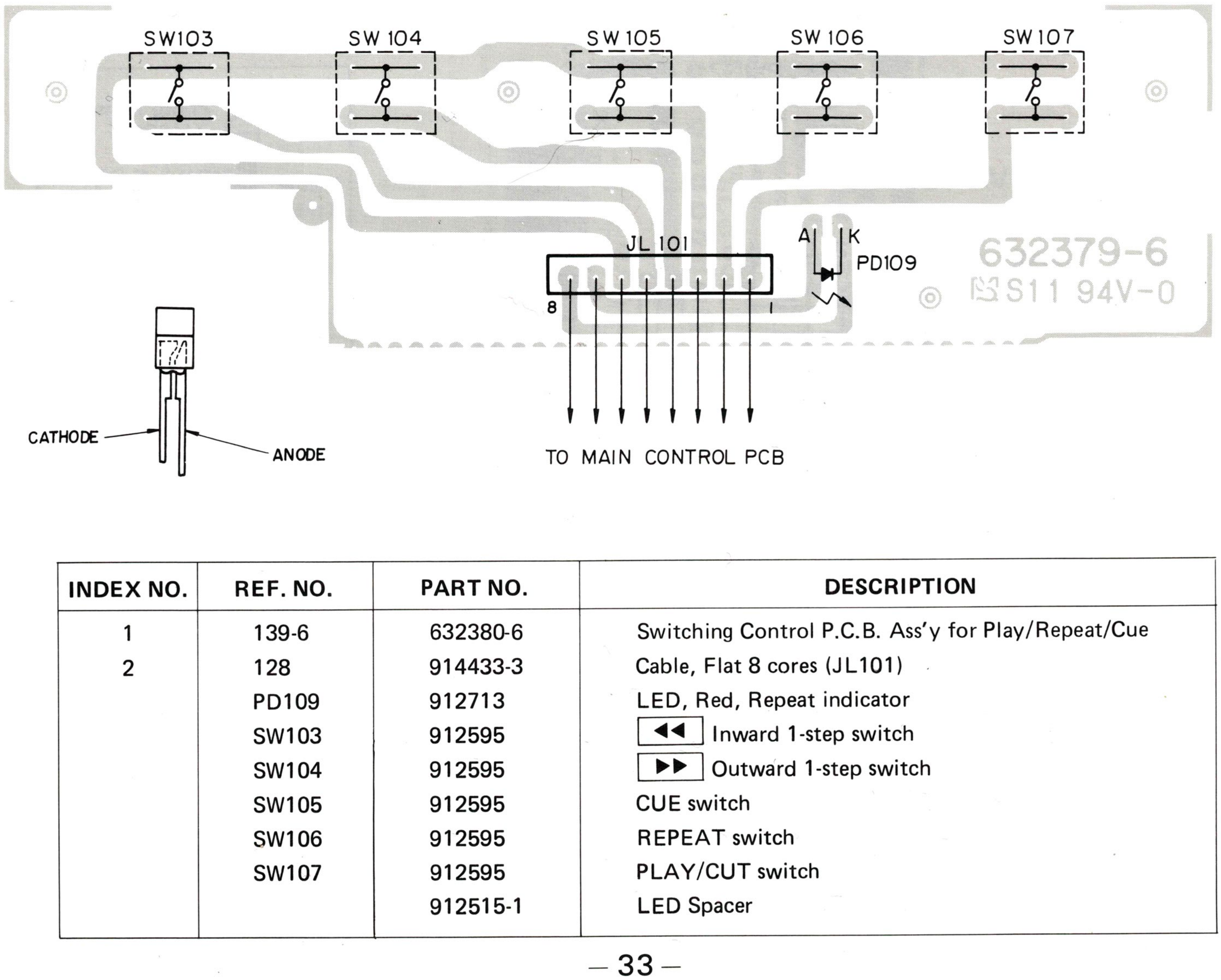
139-6 Play/Repeat/Cue Switching Control P.C. Board

TOP VIEW



BOTTOM VIEW



INDEX NO.	REF. NO.	PART NO.	DESCRIPTION
1	139-6	632380-6	Switching Control P.C.B. Ass'y for Play/Repeat/Cue
2	128	914433-3	Cable, Flat 8 cores (JL101)
	PD109	912713	LED, Red, Repeat indicator
	SW103	912595	◀◀ Inward 1-step switch
	SW104	912595	▶▶ Outward 1-step switch
	SW105	912595	CUE switch
	SW106	912595	REPEAT switch
	SW107	912595	PLAY/CUT switch
		912515-1	LED Spacer

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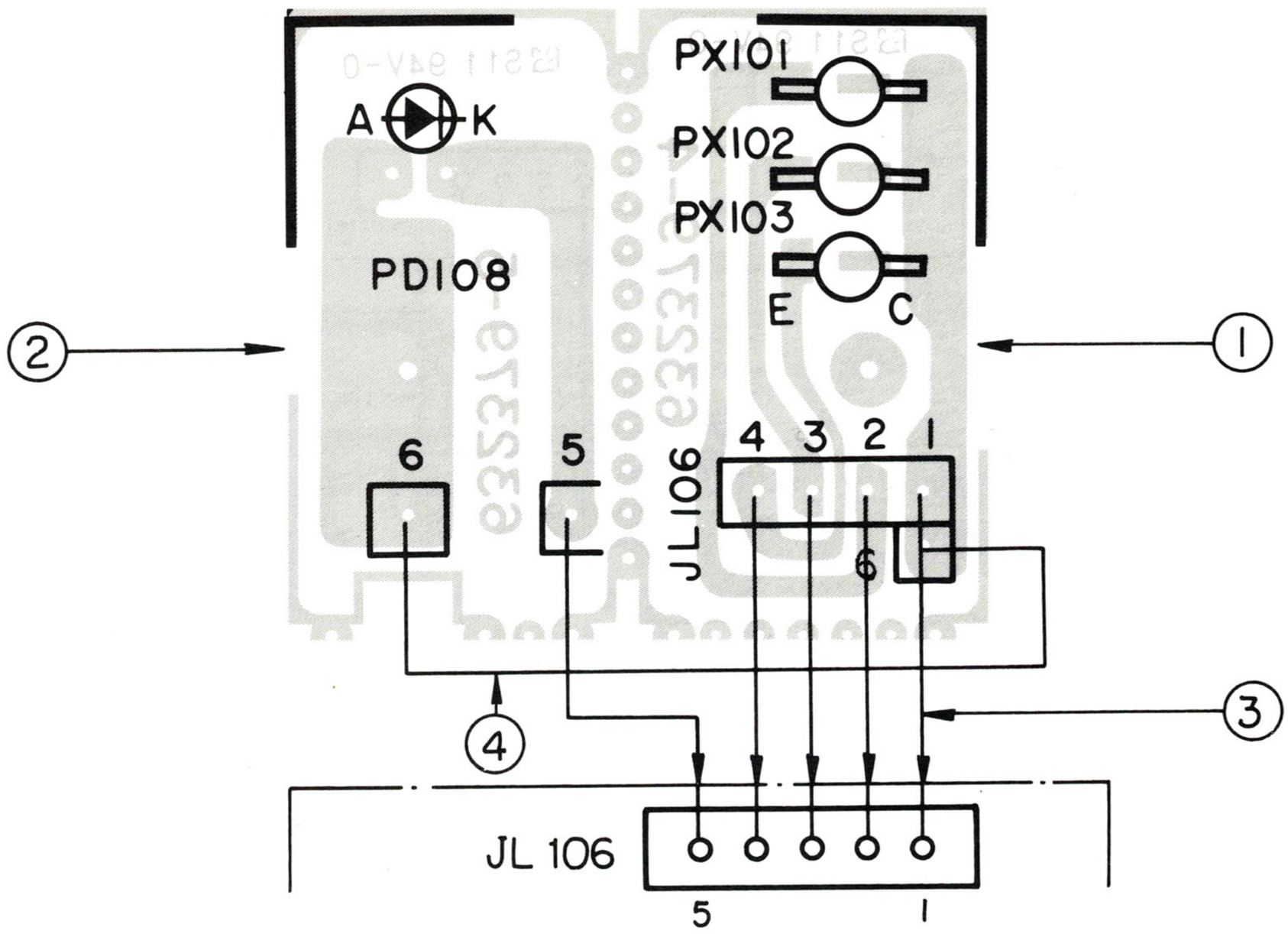
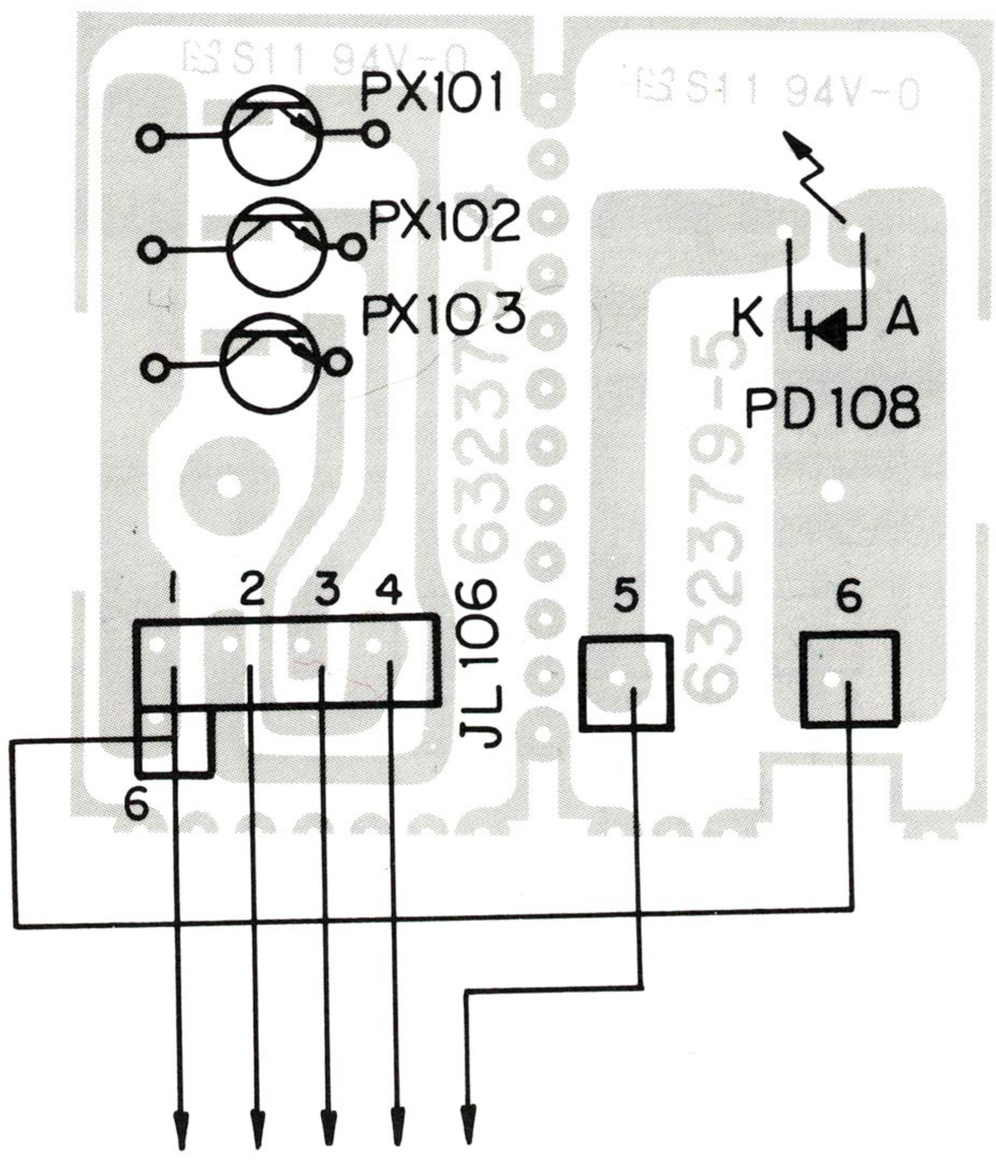
139-4/139-5 Position Sensor P.C. Board

TOP VIEW

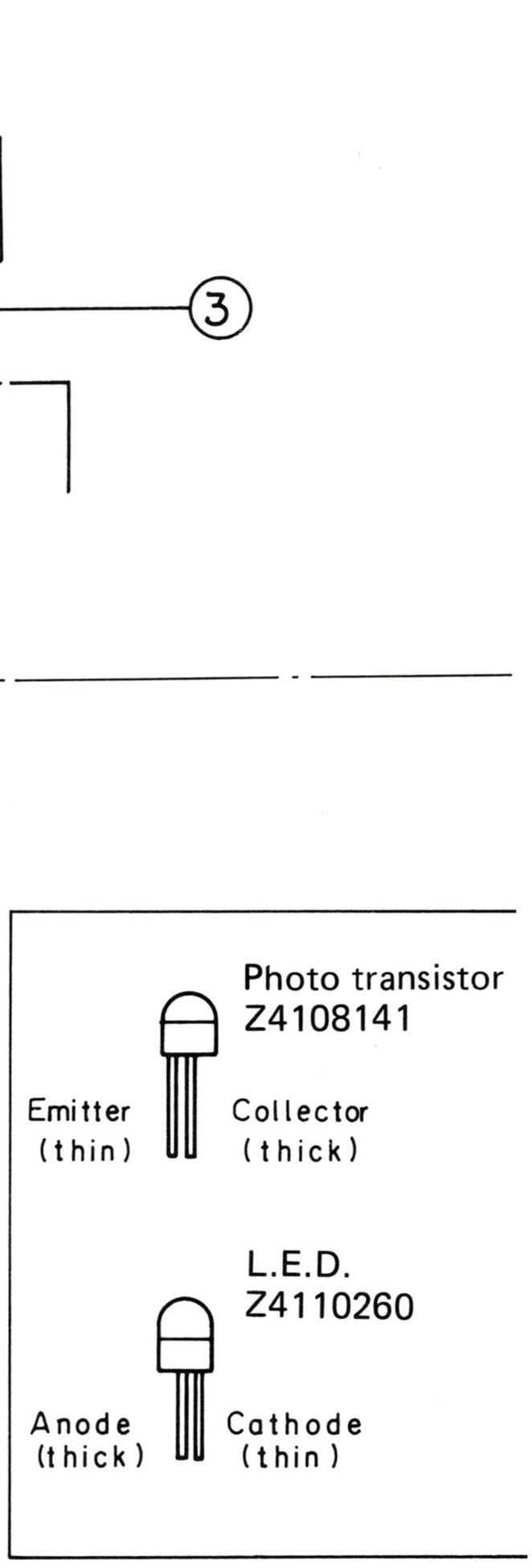


MAIN CONTROL PCB

BOTTOM VIEW



TO MAIN CONTROL PCB



INDEX NO.	REF. NO.	PART NO.	DESCRIPTION
1	139-4	632380-4	Photo Transistor P.C.B. Ass'y
2	139-5	632380-5	LED P.C.B. Ass'y
3	137	9144331	Cable, Flat 5 cores (JL106)
4		911717-3	Lead wire
	PX101	Z4108141	Photo Transistor, PN120 for 7" position
	PX102	Z4108141	Photo Transistor, PN120 for Return position
	PX103	Z4108141	Photo Transistor, PN120 for 12" position
	PD108	Z4110260	LED, SEL-2110S, Red

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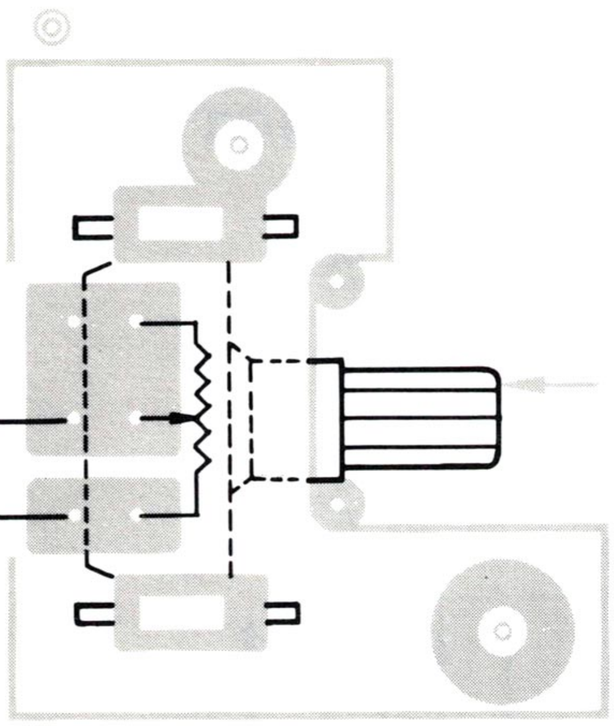
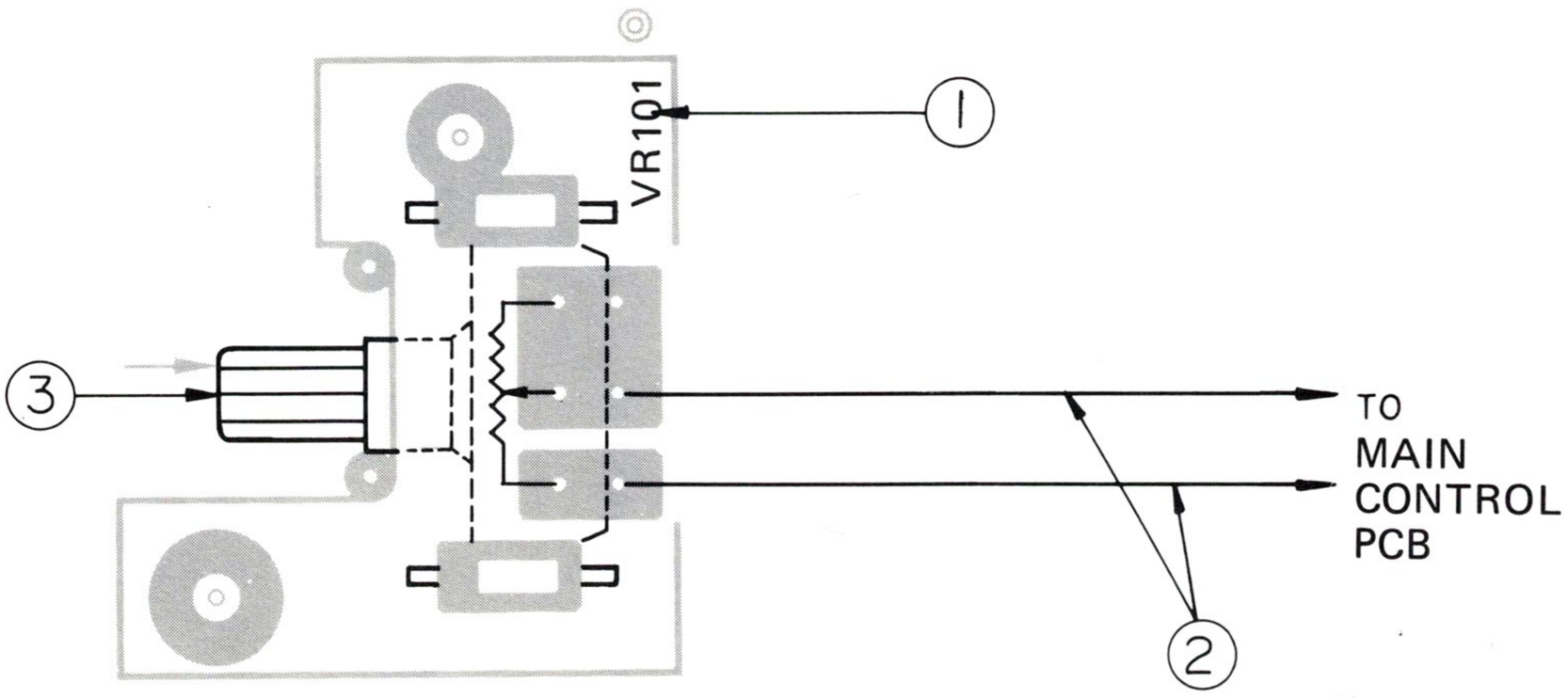
139-2 Pitch Control P. C. Board

TOP VIEW



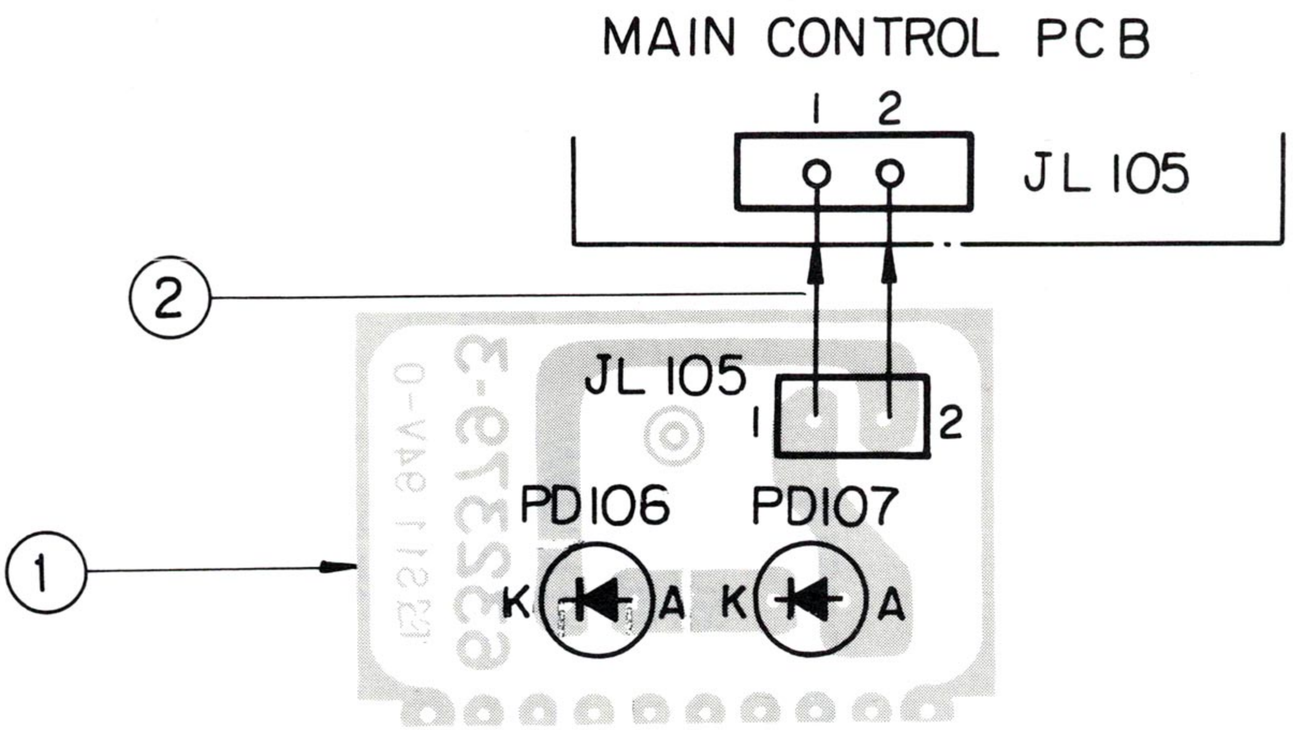
BOTTOM VIEW



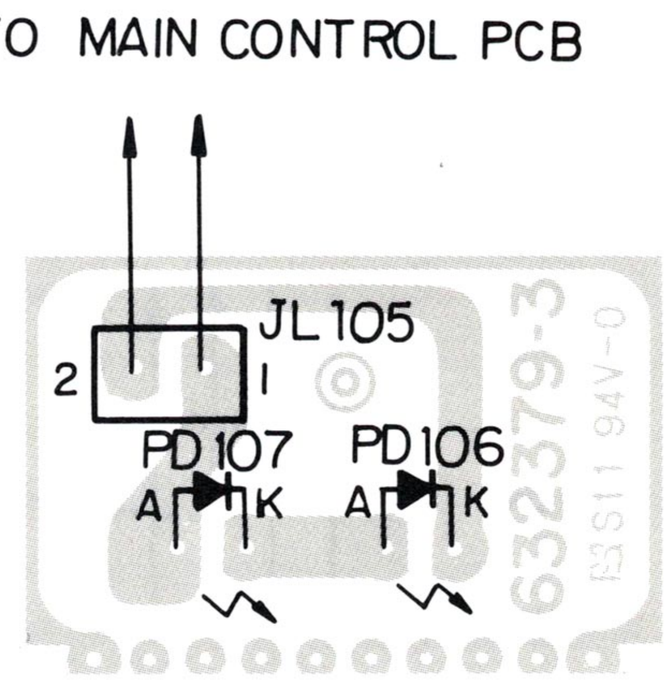
INDEX NO.	REF. NO.	PART NO.	DESCRIPTION
1	139-2	632380-2	Pitch Control P.C.B. Ass'y
2	130	914433	Cable, Flat 2 cores (JL103)
3	VR101	910961-1	Potentiometer, 50K (B)

139-3 Strobe LED P.C. Board

TOP VIEW



BOTTOM VIEW



INDEX NO.	REF. NO.	PART NO.	DESCRIPTION
1	139-3	632380-3	Strobe LED P.C.B. Ass'y
2	135	914433	Cable, Flat 2 cores (JL105)
	PD106	899908	LED, AA-5534S, Red
	PD107	899908	LED, AA-5534S, Red

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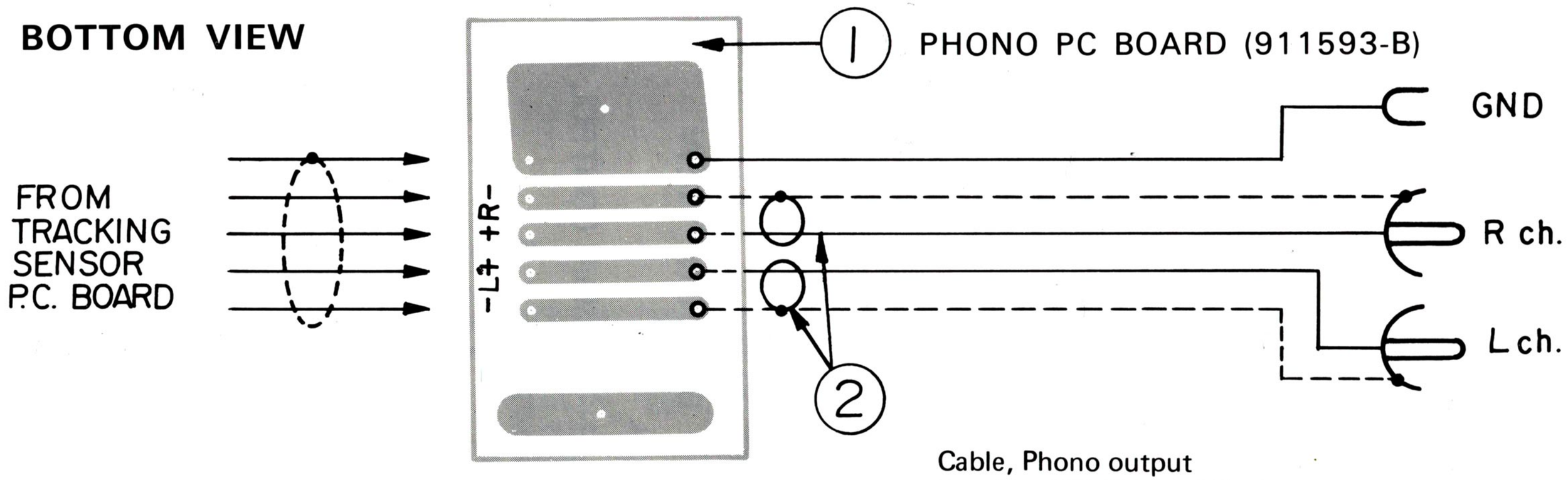
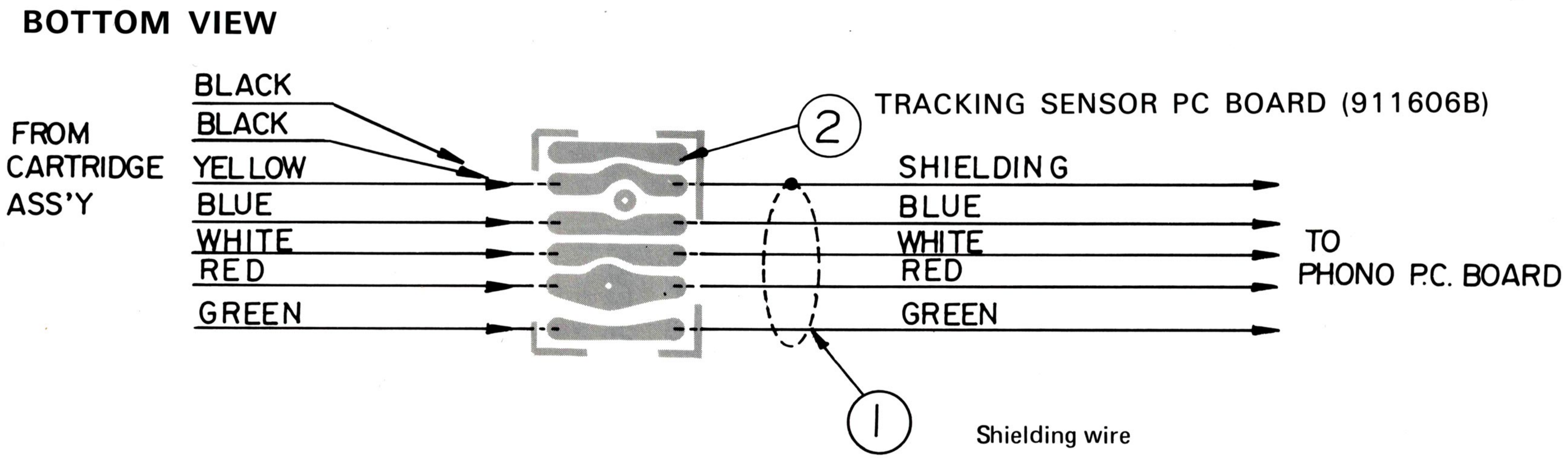
48-2 Phono P.C. Board



Cable, Phono output
Part No. 871474 for USA/CANADA versions
Part No. 870771 for UK/Europe/Australia versions

132-1 Tracking Sensor P.C. Board



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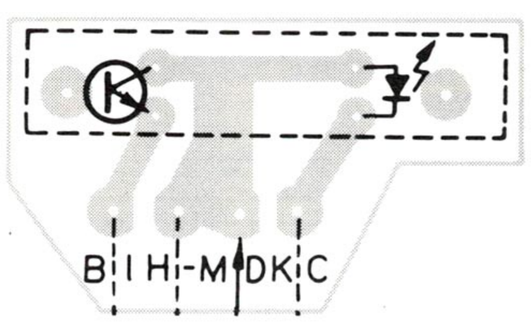
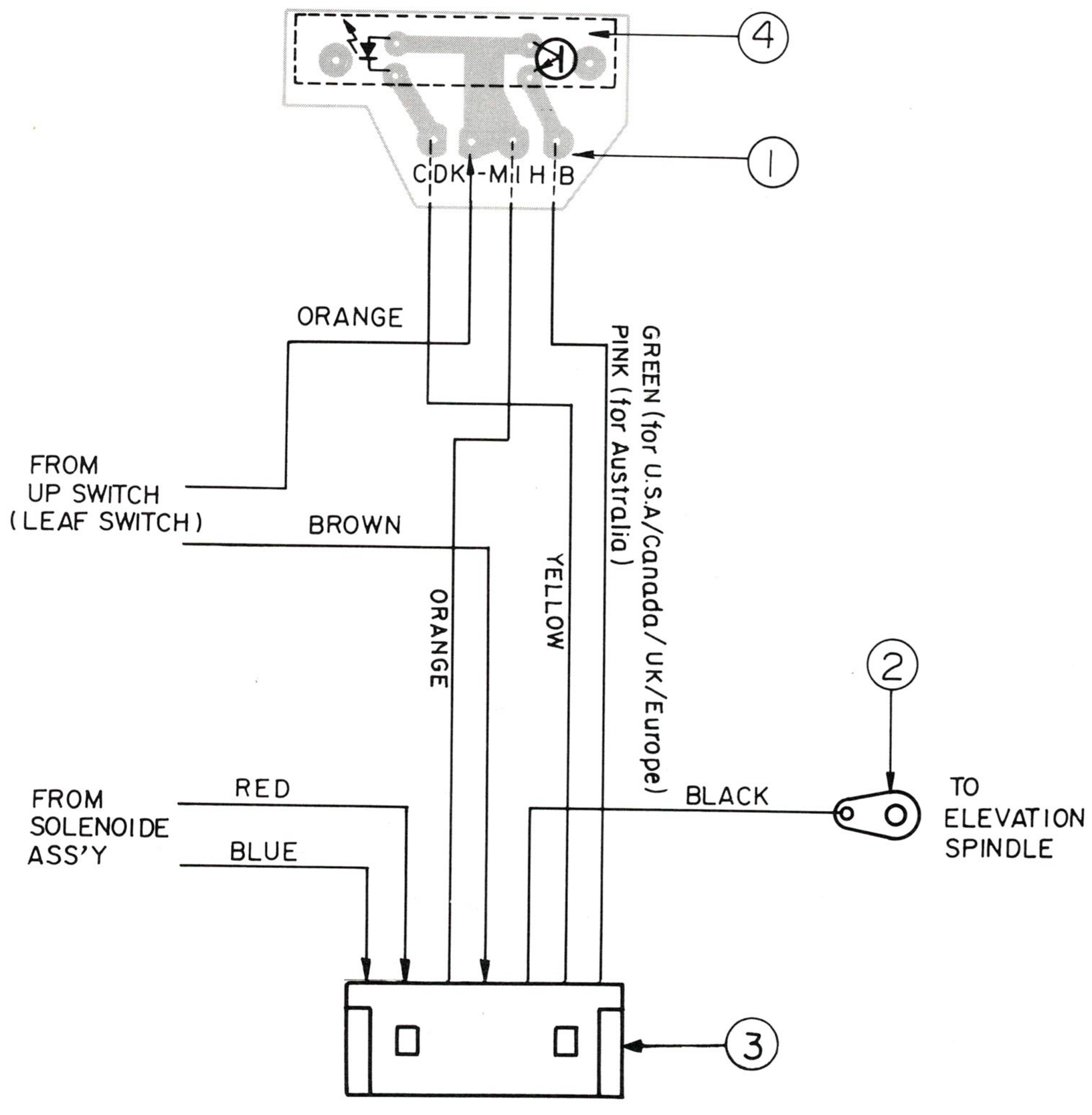
132-2 Photo Coupler P.C. Board Ass'y

TOP VIEW



BOTTOM VIEW



INDEX NO.	REF. NO.	PART NO.	DESCRIPTION
1	132-2	911664-2B	Photo coupler P.C.B. Ass'y
2	31	Z42600702	Lug terminal, 4mm Dia.
3	131	914335	Connector ass'y (1) (for USA/Canada/UK/European version)
		914335-2	(for Australian version)
4	PS101	911624	Photo coupler

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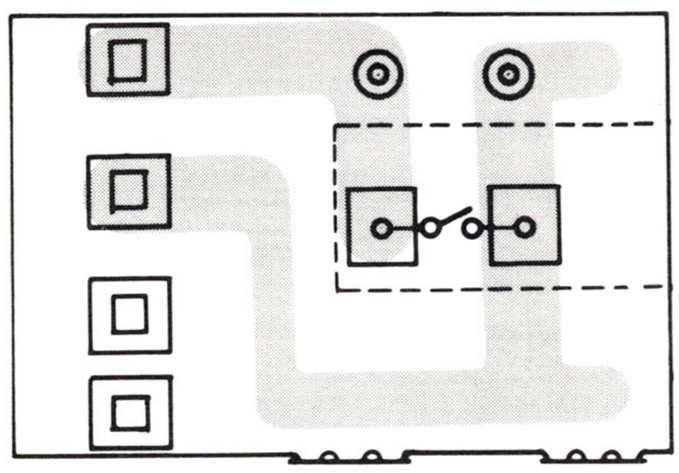
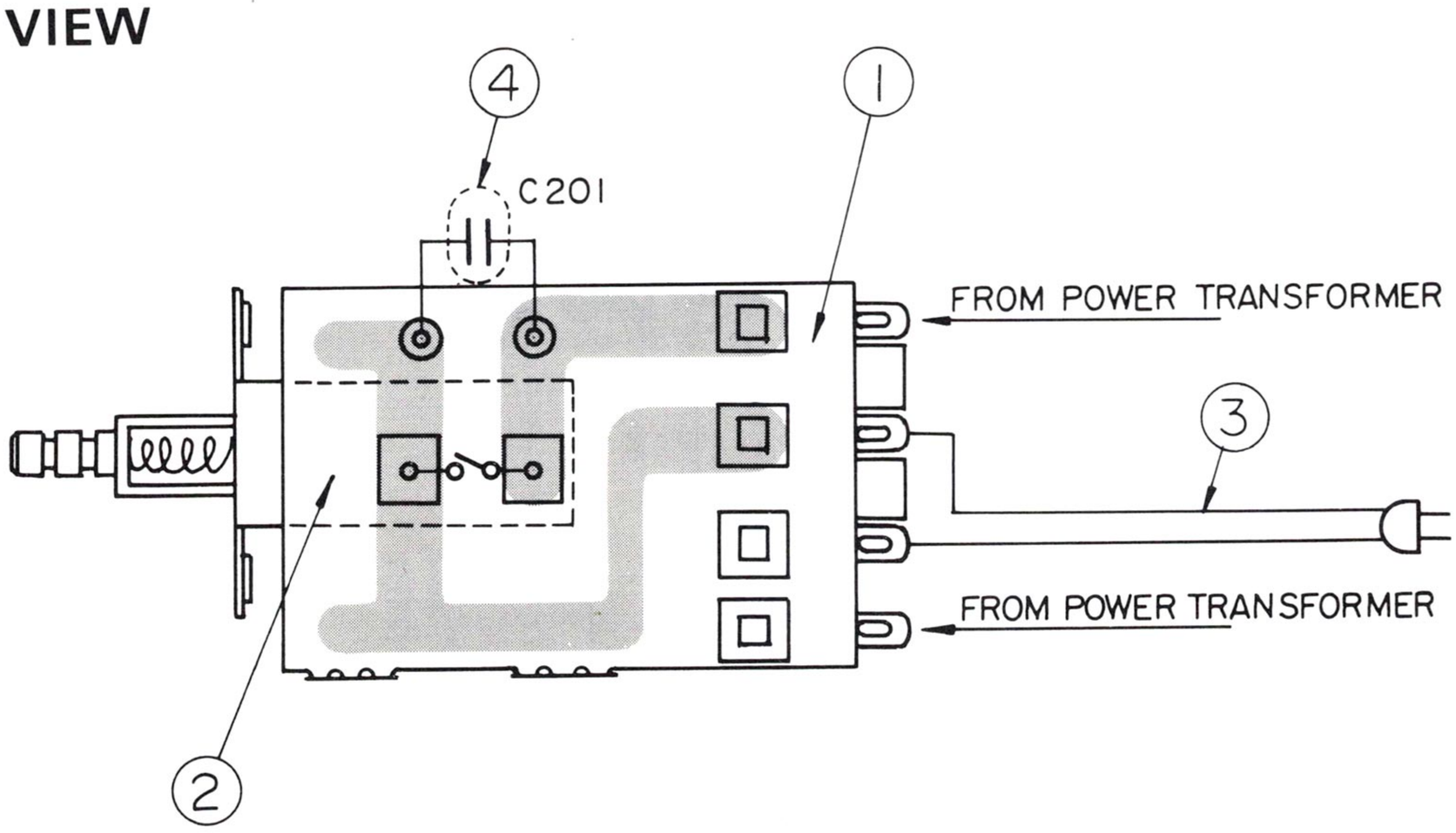
48-1 Power Switch P.C. Board Ass'y

TOP VIEW



BOTTOM VIEW



INDEX NO.	REF. NO.	PART NO.	DESCRIPTION
	48-1	873525A	Power switch P.C.B. Ass'y (for USA/Canada)
		873264-2A	(for UK)
		873554A	(for Australia)
1		873555A	(for Europe)
2	SW201	910673-2	Power switch
	C201	899781	Spark Killing Capacitor for USA/Canada versions
		899299	Spark Killing Capacitor for UK/Australian/European versions
3	109	892435-1	Power supply cord for USA/Canada versions
		870913	Power supply cord for UK/European versions
		891853-2	Power supply cord for Australian version
		U90100061	UL Tube, 12.5mm Dia. x 24mm (L)

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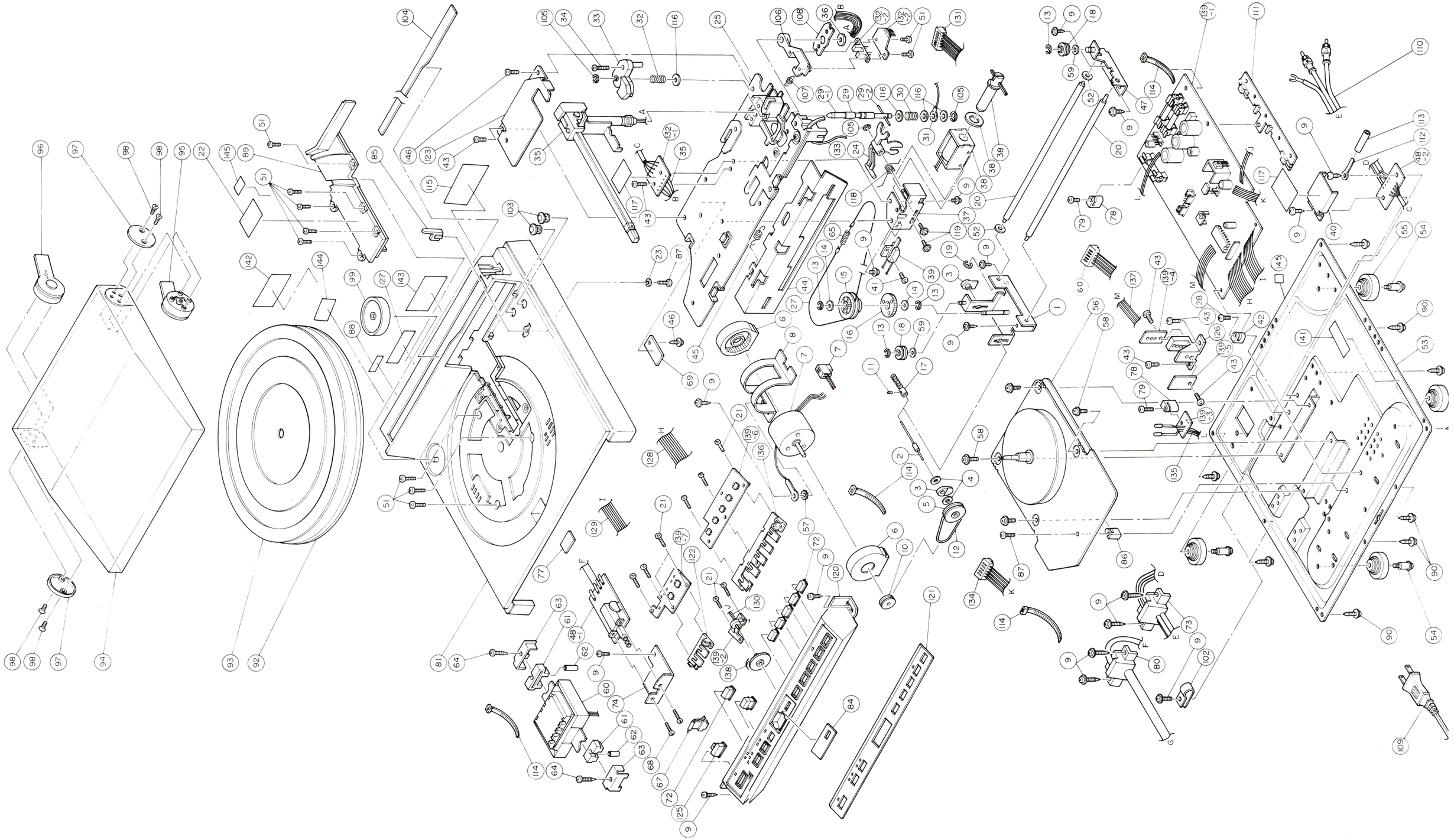
EXPLODED VIEW



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ELECTRICAL PARTS LIST

Product Safety Note: Products marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice of this service manual. Don't degrade the safety of the product through improper servicing.

139-1	MAIN CONTROL P.C.B. ASS'Y(for U.S.A./Canada) (for U.K./Australia/Europe)	X9908	632380-1 632432-1
REF. NO.	**DESCRIPTION**	**RS PART NO**	**MFR'S PART NO.**
	CAPACITORS		
C101	Electrolytic, 1000μF/35V, ±20% (S-type)	CC-108MGNP	Z4086012
C102	Electrolytic, 1000μF/25V, ±20% (S-type)	CC-108MFNP	Z4086009
C103	Electrolytic, 1000μF/25V, ±20% (S-type)	CC-108MFNP	Z4086009
C104	Electrolytic, 47μF/25V, ±20% (S-type)	CC-476MFNP	Z4080307
C105	Electrolytic, 100μF/16V, ±20% (S-type)	CC-107MDNP	Z4080207
C106	Electrolytic, 100μF/16V, ±20% (S-type)	CC-107MDNP	Z4080207
C107	Electrolytic, 1μF/50V, ±20% (S-type)	CC-105MJNP	Z4080505
C108	Ceramic, 0.01μF/50V, +80% – 20%	CC-103JJCP	Z4083825
C109	Ceramic, 68μF/50V(J), +80% – 20% (U-type)	CC-680JJCP	Z4086207
C110	Not used		
C111	Ceramic, 0.01μF/50V, +80% – 20%	CC-103JJCP	Z4083825
	DIODES		
BD101	RB-151 Bridge, Silicon 70V 1.5A	DX-1831	Z4110031
BD102	RB-151 Bridge, Silicon 70V 1.5A	DX-1831	Z4110031
D101-	IS953, Silicon 30V 100mA	DX-0259	Z4110111
D106	or IS1588, Silicon 30V 100mA		Z4110151
D107-	F14C, Silicon 300V 1A	DX-1832	Z4110013
D108	or IS1887, Silicon 400V 1A		Z4110155
	or EM-1, Silicon 400V 1A		Z4110200
D109-	IS953, Silicon 30V 100mA	DX-0259	Z4110111
D111	or IS1588, Silicon 30V 100mA		Z4110151
ZD101-	Zener RD5.6E, Silicon 400mW 5.6V	DX-1381	Z4112042
ZD102	or Zener HZ6B-1L, Silicon 500mW 5.6V		Z4112591
	ICS		
IC101	MP2001 (LM6416E), N-Mos, Micro Processor	MX-5607	707047
IC102	μPC4558C, OP-Amp, Signal amplification	MX-4436	Z41200261
	or NJM4558D, OP-Amp, Signal amplification		Z41200303

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REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	RESISTORS		
R101	Carbon, 1.8K ohm 1/4W, ±5%	N-0210EEC	Z4050479
R102	Carbon, 1.8K ohm 1/4W, ±5%	N-0210EEC	Z4050479
R103	Array (33K ohm 1/4W, 8 pcs.) IHR-8-333JA	RX-0421	Z4058087
	or RA8R		Z4058086
R104	Carbon, 10K ohm 1/4W, ±5%	N-0281EEC	Z4050497
R105	Carbon, 220 ohm 1/2W, ±5%	N-0149EFC	Z4058064
R106	Carbon, 68K ohm 1/4W, ±5%	N-0354EEC	Z4050517
R107	Carbon, 5.6K ohm 1/4W, ±5%	N-0257EEC	Z4050491
R108	Carbon, 560K ohm 1/4W, ±5%	N-0429EEC	Z4050539
R109	Not used		
R110	Carbon, 10K ohm 1/4W, ±5%	N-0281EEC	Z4050497
R111	Carbon, 33K ohm 1/4W, ±%5	N-0324EEC	Z4050509
R112	Carbon, 15K ohm 1/4W, ±5%	N-0297EEC	Z4050501
R113	Carbon, 1.0M ohm 1/4, ±5%	N-0445EEC	Z4050545
R114	Carbon, 33K ohm 1/4W, ±5%	N-0324EEC	Z4050509
R115	Carbon, 10K ohm 1/4W, ±5%	N-0281EEC	Z4050497
R116	Carbon, 1.2K ohm 1/4W, ±5%	N-0199EEC	Z4050475
R117	Carbon, 330 ohm 1/4W, ±5%	N-0159EEC	Z4050461
R118	Not used		
R119	Carbon, 68K ohm 1/4W, ±5%	N-0354EEC	Z5050517
R120	Carbon, 120K ohm 1/4W, ±5%	N-0375EEC	Z4050523
R121	Carbon, 39K ohm 1/4W, ±5%	N-0330EEC	Z4050511
R122	Carbon, 330K ohm 1/4W, ±5%	N-0410EEC	Z4050533
R123	Carbon, 33K ohm 1/4W, ±5%	N-0324EEC	Z4050509
R124	Metal Film, 33K ohm 1/4W, ±1%	N-0324EEC	Z4053309
R125	Carbon, 10K ohm 1/4W, ±5%	N-0281EEC	Z4050497
R126	Carbon, 3:3K ohm 1/4W, ±5%	N-0230EEC	Z4050485
R127	Carbon, 470 ohm 1/4W, ±5%	N-0169EEC	Z4050465
R128	Carbon, 33K ohm 1/4W, ±5%	N-0324EEC	Z4050509
R129	Carbon, 100K ohm, 1/4W, ±5%	N-0371EEC	Z4050521
R130	Carbon, 100K ohm, 1/4W, ±5%	N-0371EEC	Z4050521
R131	Carbon, 2.2K ohm 1/4W, ±5%	N-0216EEC	Z4050481
R132	Carbon, 33K ohm 1/4W, ±5%	N-0324EEC	Z4050509
R133-R135	Carbon, 470K ohm 1/4W, ±5%	N-0423EEC	Z4050537

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REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	RESISTORS		
R136	Carbon, 470 ohm 1/4W, ±5%	N-0169EEC	Z4050465
R137	Carbon, 10K ohm 1/4W, ±5%	N-0281EEC	Z4050497
R138-R141	Carbon, 15K ohm 1/4W, ±5%	N-0297EEC	Z4050501
R142	Carbon, 270 ohm 1/4W, ±5%	N-0155EEC	Z4050459
R143	Not used		
R144	Carbon, 270 ohm 1/4W, ±5%	N-0155EEC	Z4050459
VR102	10K ohm (B) 1/4W, VZ083L1, Potentiometer ±25%, Gain Control	P-7349	704825-8
	TRANSISTORS		
X101	Silicon, 2SD882 (Q), (P), (E) (NPN)	2SD-882	Z4106133,2,1
X102	Silicon, 2SA952 (L), (K) (PNP)	2SA-733	Z4100162,1
	or 2SA733 (Q), (P) (PNP)		Z4100103,2
X103	Silicon, 2SC945 (Q), (P) (NPN)	2SC-1815	Z4104103,2
	or 2SC1815 (Y), (GR) (NPN)		Z4104252,1
X104	Silicon, 2SA733 (Q), (P) (PNP)	2SA-733	Z4100103,2
	or 2SA1015 (Y), (GR) (PNP)		Z4100192,1
X105	Silicon, 2SC945 (Q), (P) (NPN)	2SC-1815	Z4104103,2
	or 2SC1815 (Y), (GR) (NPN)		Z4104252,1
X106	Silicon, 2SK68 (L), (K) (N-FET)	2SK-68	Z4108012,1
X107	Silicon, 2SA733 (Q), (P) (PNP)	2SA-733	Z4100103,2
	or 2SA1015 (Y), (GR) (PNP)		Z4100192,1
X108-X109	Silicon, 2SD667 (C), (D) (NPN)	2SD-667	Z4106072,3
	or 2SD571 (L), (K) (NPN)		Z4106062,1
	or 2SC2655 (Y) (NPN)		Z4104402
X110	Silicon, 2SB647 (C), (D) (PNP)	2SB-647	Z4102042,3
	or 2SA1020 (Y) (PNP)		
X111-X113	Silicon, 2SC945 (Q), (P) (NPN)	2SC-1815	Z4104103,2
	or 2SC1815 (Y), (GR) (NPN)		Z4104252,1
X114	Silicon, 2SD667 (C), (D) (NPN)	2SD-667	Z4106072,3
	or 2SD571 (L), (K) (NPN)		Z4106062,1
	or 2SC2655 (Y) (NPN)		Z4104402
X115-X116	Silicon, 2SA733 (Q), (P) (PNP)	2SA-733	Z4100103,2
	or 2SA1015 (Y), (GR) (PNP)		Z4100192,1

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REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	MISCELLANEOUS		
A1100P (A1P3)	Heat sink Ass y		911381
CNP101	Connector Post WP-9005, 5P Female	J-4872	706033-5
CNP102	Connector Post 5045-02A, 2P Female	J-4877	896351-2
CNP103	Connector Post WP-9007, 7P Female	J-4875	706033-7
FUSE101-FUSE103	⚠ Fuse 1A, 250V ϕ6 (for U.S.A./Canada)	HF-1178	704395-2
FUSE101	⚠ Fuse T400mA, 250V ϕ5 (for U.K./Australia /Europe)		893791-1
FUSE102-FUSE103	⚠ Fuse T500mA, 250V ϕ5 (for U.K./Australia /Europe)		892171
JL101	Wire, Jumper 10 (L), Connecting pattern on PCB		704845
JL102	Wire, Jumper 7.5 (L), Connecting pattern on PCB		704845-2
JL103	Wire, Jumper 15 (L), Connecting pattern on PCB		704845-4
JL104-JL109	Wire, Jumper 10 (L), Connecting pattern on PCB		704845
TP101-TP104	Terminal, Check Pin	J-1328	705781
	Holder, Fuse for ϕ6 (for U.S.A./Canada)	F-1217	893395-1
	Holder, Fuse for ϕ5 (for U.K./Australia/Europe)		893395
	Label, Fuse 1A 250V (for U.S.A./Canada)		703977-1
	Label, Fuse T400mA, 250V (for U.K./Australia /Europe)		705295-4
	Label, Fuse T500mA, 250V (for U.K./Australia /Europe)		705295
	Screw, Tapping Tite, Pan Head, + 3 x 8	HD-3028	Y10300803

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56	MAIN MOTOR CONTROL P.C.B. ASS'Y	X-9360	632171
REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	CAPACITORS		
C1	Electrolytic, 10μF/16V, ±20% (S-type)	CC-106MDNP	Z4080201
C2	Ceramic, 0.001μF/50V, +80%—20%	CC-102JJCP	Z4083613
C3	Electrolytic, 1μF/50V, ±20% (S-type)	CC-105MJNP	Z4080505
C4	Ceramic, 0.01μF/50V, +80%—20%	CC-103JJCP	Z4083825
C5	Mylar, 0.01μF/50V (K), ±10% (TDY-type)	CC-103JJMP	Z4082113
C6	Mylar, 0.01μF/50V (K), ±10% (TDY-type)	CC-103JJMP	Z4082113
C7	Mylar, 0.022μF/50V (K), ±10% (TDY-type)	CC-223JJMP	Z4082117
C8	Mylar, 0.1μF/50V (J), ±5% (TDY-type)	CC-104JJMP	Z4082025
C9	Electrolytic, 0.22μF/50V, ±20% (S-type)	CC-224MJNP	Z4080501
C10	Ceramic, 0.047μF/25V, +80%—20%	CC-473ZFCP	Z4083533
C11	Ceramic, 0.047μF/25V, +80%—20%	CC-473ZFCP	Z4083533
C12	Electrolytic, 47μF/25V, ±20% Bi-polar or Non-polar	CC-476MFBP	Z4086100
C13	Electrolytic, 47μF/25V, ±20% Bi-polar or Non-polar	CC-476MFBP	Z4086100
C14	Electrolytic, 1μF/50V, ±20% (S-type)	CC-105MJNP	Z4080505
C15	Ceramic, 0.01μF/50V, +80%—20%	CC-103JJCP	Z4083825
	DIODES		
D1	1SS53, Silicon 30V 100mA	DX-0322	Z4110101
	or 1S953, Silicon 30V 100mA		Z4110111
	or 1S1588, Silicon 30V 100mA		Z4110151
ZD1	Zener RD-13E (B3), Silicon 400mW 13V	DX-1408	Z4112124
	IC		
IC1	μPC1043C, Motor Control	MX-5335	Z4120021

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REF. NO.	DESCRIPTION	RS PART NO	MFR'S PART NO.
	RESISTORS		
R1	Carbon, 1K ohm, RD-25S, 1/4W ±5%	N-0196EEC	Z4050473
R2	Carbon, 560K ohm, RD-25U, 1/4W ±5%	N-0429EEC	Z4050339
R3	Carbon, 12K ohm, RD-25R, 1/4W ±5%	N-0288EEC	Z4050299
R4	Carbon, 1M ohm, RD-25U, 1/4W ±5%	N-0162BFD	Z4050345
R5	Oxide Metal, 390 ohm, 1/2W ±5%	N-0371EEC	Z4058060
R6	Carbon, 100K ohm, RD-25U, 1/4W ±5%	N-0423EEC	Z4050321
R7	Carbon, 470K ohm, RD-25U, 1/4W ±5%	N-0169EEC	Z4050337
R8	Carbon, 100 ohm, RD-25S, 1/4W ±5%	N-0132EEC	Z4050449
R9	Carbon, 100 ohm, RD-25S, 1/4W ±5%	N-0132EEC	Z4050449
R10	Carbon, 1K ohm, RD-25S, 1/4W ±5%	N-0196EEC	Z4050473
R11	Carbon, 1K ohm, RD-25S, 1/4W ±5%	N-0196EEC	Z4050473
R12	Carbon, 18K ohm, RD-25U, 1/4W ±5%	N-0303EEC	Z4050303
R13	Carbon, 18K ohm, RD-25U, 1/4W ±5%	N-0303EEC	Z4050303
R14	Carbon, 33K ohm, RD-25U, 1/4W ±5%	N-0324EEC	Z4050309
R15	Carbon, 6.8K ohm, RD-25S, 1/4W ±5%	N-0262EEC	Z4050493
R16	Carbon, 6.8K ohm, RD-25S, 1/4W ±5%	N-0262EEC	Z4050493
R17	Carbon, 1K ohm, RD-25S, 1/4W ±5%	N-0196EEC	Z4050473
R18	Carbon, 1K ohm, RD-25S, 1/4W ±5%	N-0196EEC	Z4050473
R19	Carbon, 4.7 ohm, RD-50S, 1/2W ±5%	N-0047BFE	Z4058002
R20	Carbon, 4.7 ohm, RD-50S, 1/2W ±5%	N-0047BFE	Z4058022
R21	Carbon, 120K ohm, RD-25U, 1/4W ±5%	N-0375EEC	Z4050323
R22	Metal Film, 150 ohm, 1/4W ±1%	N-0142BFE	Z4053325
R23	Carbon, 22K ohm, RD-25S, 1/4W ±5%	N-0311EEC	Z4050505
VR1	100K ohm (B), VZ083L1, Potentiometer ±25% or 100K ohm (B), KVSF867V, Potentiometer ±25%	P-7350	Z4060003 706535
VR2	100K ohm (B), VZ083L1, Potentiometer ±25% or 100K ohm (B), KVSF867V, Potentiometer ±25%	P-7350	Z406003 706535
	TRANSISTORS		
X1- X2	Silicon, 2SC945 (P) or (Q) or (K) (NPN) or 2SC2308 (C) (NPN) or 2SC1815 (Y) or (GR) (NPN) or 2SC2785 (F) or (E) (NPN)	2SC-1815	Z4104102,3,1 Z4104352 Z4104252,1 Z4104362,1
X3- X8	2SA733(P) or (Q) (PNP) or 2SA844 (C) or (D) (PNP) or 2SA1015 (Y) or (GR) (PNP) or 2SA1175 (F) or (E) (PNP)	2SA-733	Z4100102,3 Z4100132,3 Z4100192,1 Z4100202,1
X9 X12	2SC2001 (K) or (L) (NPN) or 2SC2120 (Y) or (GR) (NPN)	2SC-2120	Z4104292,3 Z4104323,1

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REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	MISCELLANEOUS		
CNP1	Connector Post 5046-06A, 6P Female	J-4878	Z42600313
	Element, Hall MP-10H-15F	MX-5336	705715
	P.C.B., Hall Element KU-3594V-0	X-9370	706354
	or CDK-M3V		706454-1
	or TDK-T8V		706354-2
	Pin, Terminal ϕ0.8 x L11.5	J-4879	Z42600804

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OTHER P.C.B. ASS'Y			
REF. NO.	**DESCRIPTION**	**RS PART NO.**	**MFR'S PART N(**
139-2	**PITCH CONTROL PCB ASS'Y**	**X-9900**	**632380-2**
VR101	Potentiometer, 50Kohm (B), 1/4W, K161A	P-7351	910961-1
130	Cable, Flat 2 cores (JL103)		914433
139-3	**STROBE L.E.D. PCB ASS'Y**	**X-9901**	**632380-3**
PD106	L.E.D. (Red) AA-5534S	DX-1830	899908
PD107	L.E.D. (Red) AA-5534S	DX-1830	899908
135	Cable, Flat 2 cores (JL105)		914433
139-4	**PHOTO TRANSISTOR PCB ASS'Y**	**X-9902**	**632380-4**
PX101	Photo Transistor, PN120 for 7"	MX-5829	Z4108141
PX102	Photo Transistor, PN120 for Return	MX-5829	Z4108141
PX103	Photo Transistor, PN120 for 12"	MX-5829	Z4108141
137	Cable, Flat 5 cores (JL106)		914433-1
139-5	**POSITION LED PCB ASS'Y**	**X-9903**	**632380-5**
PD108	L.E.D. (Red) SEL-2110S	L-1643	Z4110260
	Wire, Lead		911717-3
139-6	**PLAY/REPEAT/CUE SWITCHING CONTROL PCB ASS'Y**	**X-9904**	**632380-6**
PD109	L.E.D. (Red) SEL1124R, Repeat indicator	L-1476	912713
SW103	Switch Tact KHH10902, for INWARD	S-2859	912595
SW104	Switch Tact KHH10902, for OUTWARD	S-2859	912595
SW105	Switch Tact KHH10902, for CUE	S-2859	912595
SW106	Switch Tact KHH10902, for REPEAT	S-2859	912595
SW107	Switch Tact KHH10902, for PLAY/CUT	S-2859	912595
128	Cable, Flat 8 cores (JL101)		914433-3
	Spacer, L.E.D.	RD-6238	912515-1
139-7	**SPEED/SIZE SWITCHING CONTROL PCB ASS'Y**	**X-9905**	**632380-7**
PD101	L.E.D. (Yellow-Green) SEL1324G, 45rpm indicator	L-1477	912714
PD102	L.E.D. (Yellow-Green) SEL1324G, 33rpm indicator	L-1477	912714
PD103	L.E.D. (Yellow-Green) SEL1324G, 7" size indicator	L-1477	912714
PD104	L.E.D. (Yellow-Green) SEL1324G, 12" size indicator	L-1477	912714
PD105	L.E.D. (Red) SEL1124R, Power Indicator	L-1476	912713
R143	Resistor, Carbon 390ohm 1/4W, ±5%	N-0162EEC	Z4051132
R145	Resistor, Carbon 390ohm 1/4W, ±5%	N-0162EEC	Z4051132
R146	Resistor, Carbon 470ohm 1/4W, ±5%	N-0169EEC	Z4051133
	Resistor, Carbon, 390ohm 1/4W, ±5%		

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REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
139-7	**SWITCHING CONTROL PCB ASS'Y (Cont'd)**	**X-9905**	**632380-7**
SW101	Switch Tact KHH10902, for SPEED	S-2859	912595
SW102	Switch Tact KHH10902, for SIZE	S-2859	912595
X117- X118	Transistor, Silicon, 2SC945 (Q) (P) (NPN) or 2SC1815 (Y), (GR) (NPN)	2SC-1815	Z4104103,2 Z4104252,1
129	Cable, Flat 6 cores (JL102)		914433-2
	Spacer, L.E.D.	RD-6239	912515-2
48-1	**POWER SWITCH PCB ASS'Y**	X-9359	873525A
C201	⚠ Capacitor Ceramic, 0.01μF. 125V, +100%—0, Spark Killing (for U.S.A./Canada)	C-1249	899781
	⚠ Capacitor Ceramic, 0.01μF/400V, +100%—0, Spark Killing (for U.K./Australia/Europe)		899299
SW201	⚠ Switch, Push for Power	S-2861	910673-2
109	Cord, AC Power Supply (for U.S A./Canada)	W-1000	892435-1
	Cord, AC Power Supply (for U.K.)		870913
	Cord, AC Power Supply (for Australia)		891853-2
	Cord, AC Power Supply (for Europe)		899781
	Tube, UL 12.5mm Dia. x 24mm (L)		U9010061
48-2	**PHONO PCB ASS'Y**	X-9898	873525B
110	Cable, Phono Output (for U.S.A./Canada)	W-2995	871474
	Cable, Phono Output (for U.K./Australia/Europe)		870771
132-1	**TRACKING SENSOR PCB ASS'Y**	**X-9899**	**911664-2A**
	Wire, Shield		911665-2
132-2	**PHOTO COUPLER PCB ASS'Y**		**911664-2B**
PS101	Coupler, Photo ON1122	CS-0106	911624
31	Lug Terminal, 4mm Dia.	J-4870	Z42600702
131	Connector Ass'y (1) to CNP103	J-5206	914335

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EXPLODED VIEW PARTS LIST

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
1	Plate, Base, Mechanism		914388
2	Shaft, Worm Gear	RD-6295	705855-1
3	Bearing, Worm Gear	RD-6209	897675
4	Washer, Polyester Slider, 2.1 x 4 x 0.5t	HD-8166	YP2104005
5	Pulley (2), Worm Gear	RA-0510	897677
6	Cushion, Rubber, Motor		873145-1
7	Motor, DML-148U-51S1 with connector ass'y to CNP 102 of Main Control PCB	M-4718	706443
8	Plate, Motor Mounting	RT-4605	911354
9	Screw, Tapping Tite, Pan Head, ⊕ 3 x 6	HD-3026	Y10300604
10	Pulley (1), Sub-Motor	RA-0737	914317
11	Screw, Set, Slot, ⊖ 2 x 3	HD-2137	Y13200301
12	Belt, Worm Gear Pulley (2)	B-6583	911598
13	Washer, E-type, 3 x 7 x 0.6t		Y34000301
14	Washer, Polyester Slider, 4.6 x 10 x 0.5t		YP4610005
15	Pulley, Drum	RA-0512	911328-1
16	Wheel, Worm	RD-6210	911327
17	Worm Gear	RD-6296	914320
18	Pulley, Wire Belt	RA-0513	911329
19	Washer, E-type, 4 x 9 x 0.6t		Y34000402
20	Bar, Guide	RD-6297	914319
21	Screw, Tapping Tite, Pan Head, ⊕ 3 x 10	HD-3019	Y10301001
22	Label, Caution, Screw Locking (for U.S.A.)		912861
	(for Canada)		912862
	(for U.K./Australia/Europe)		912861
23	Washer, Spring, 3 x 5.9 x 0.7t		Y31000301
24	Lever, Elevation	RD-6237	911333
25	Base, Tone arm	RC-9050	849970
27	Wire Belt, Drum Pulley	B-6665	914334
28	Screw, Tapping Tite, Pan Head, ⊕ 3 x 16	HD-3033	Y10301601
29	Elevation Spindle Ass'y	RC-7115	911607
	29—1. Spindle, Elevation		911335
	29—2. 1.6ϕ spindle pin		Y42161601
30	Spring, Coil, Elevation Spindle	RD-8586	910073-1
31	Terminal Lug, 4mm Dia. (included in Ref. No. 132-2)	J-4870	Z42600702
32	Spring, Coil, Elevation Plate	RD-6215	911435
33	Plate, Elevation	RT-4607	911334
34	Screw, Tapping Tite, Hex Head, ⊖ 2.6 x 15		912215

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REF. NO.	DESCRIPTION	RS PART NO.	MER'S PART NO.
35	Tone arm Ass'y with Nut M10 (REF. NO. 36)	RC-6427	852735
	35—1. Cartridge AT102EP		912721
	35—2. Stylus, AT102EP		912721S
37	Plate, Base, Solenoid	RT-4608	911611
38	Solenoid	S-9187	911612-1
39	Switch, Leaf, Tone arm UP/DOWN	S-8279	913343
40	Plate, Screen	RT-4609	911554
41	Screw, Machine, Pan Head, ⊕ 3 x 5	HD-2054	Y01300501
42	Support, Main Control PCB	RT-4610	911344-1
43	Screw, Tapping Tite, Pan Head, ⊕ 3 x 6	HD-3026	Y10300601
44	Plate, Slit		913292
45	Spring, Slit Plate	RD-6216	911613
46	Screw, Flange Tapping Tite, Pan Head, ⊕ 3 x 8		Y09300801
47	Plate, Guide Bar Holding	RT-4612	911615
48-1	PCB Ass'y, Power Switch (for U.S.A./Canada)	X-9359	873525A
	(for U.K.)		873264-2A
	(for Australia)		873554A
	(for Europe)		873555A
48-2	PCB Ass'y, Phono (for U.S.A./Canada)	X-9898	873525B
	(for U.K./Australia/Europe)		873555B
49	Not used		
50	Not used		
51	Screw, Tapping Tite, Pan Head, ⊕ 3 x 8		Y10300801
52	Washer, Rubber, 6 x 13 x 1.0t		911646-2
53	Bottom Lid Ass'y (Non-repairable)		853101
54	Screw, Special, Rubber Foot, ⊕ 3 x 4		911634
55	Foot, Rubber	F-0372	911520
56	Motor, Main Control PCB Ass'y (DDM-522M-10)	X-9360	632171
57	Washer, Tooth, 3 x 6.5 x 0.45t		Y41000302
58	Screw, Machine, Pan Head, ⊕ 4 x 12	HD-2086	Y01401202
59	Washer, Polyester Slider, 4 x 8 x 0.5t		YP4008005
60	⚠ Transformer, Power with connector ass'y to CNP101 of		
	Main Control PCB (for U.S.A./Canada)	TA-1014	873526
	(for U.K./Australia)		873528
	(for Europe)		873527
61	Cushion, Rubber, Transformer		911348
62	Bushing, Rubber Cushion, Transformer, ϕ4.1 x ϕ5.3 x 11	RD-6217	Y99000402
63	Plate, Transformer Holding	RT-4613	911349
64	Screw, Tapping Tite, Pan Head, ⊕ 4 x 20	HD-3376	Y10402002
65	Spring, Coil, Wire Belt	RB-8587	399555
67	Lever, Power Switch	RT-4616	912518
68	Screw, Machine, Pan Head, ⊕ 3 x 5	HD-2054	Y01300501

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REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
69	Plate, Holding	RT-5542	914391
72	Button, Common to PLAY/CUT/REPEAT/CUE/FF/FB/SPEED/SIZE	K-5220	912516
73	Holder (2), Cord, Phono Output Cable	RD-6218	912594
74	Plate, Base, Switch	RT-4618	912519
77	Mirror, Strobe	RD-6228	898529-5
78	Support, Main Control PCB and Strobe LED PCB	RT-4619	911344
79	Screw, Tapping Tite, Pan Head, ⊕ 3 x 20	HD-3034	Y1030200
80	Holder (1), Cord, AC Power Supply (for U.S.A./Canada)	RD-6227	912509
	(for U.K./Australia/Europe)		911362-1
81	Base, Plastic, Cabinet	Z-7555	849026-5
82	Not used		
83	Not used		
84	Window, Strobe	RD-6229	912514
85	Rest, Tone arm	RD-6230	912506-2
86	Support, Main Motor PCB	RT-4620	912758
87	Screw, Tapping Tite, Pan Head, ⊕ 3 x 25	HD-3113	Y10302501
88	Label, Date Code		913099
89	Cover, Base, Cabinet	RD-6231	852733-1
90	Screw, Flange Tapping Tite, Pan Head, ⊕ 3 x 16		Y09301609
91	Not used		
92	Platter, Turntable (for U.S.A./Canada)	RC-4175	620145
	(for U.K./Australia/Europe)		620145-1
93	Mat, Rubber (for U.S.A./Canada)	RC-4168	873144-4
	(for U.K./Australia/Europe)		873144-3
94	Cover, Dust	Y-1551	852729
95	Hinge, Side Ass'y for right side with cover (REF NO. 97)	RD-6232	911622-1
96	Hinge, Side Ass'y for left side with cover (REF NO. 97)	RD-6233	911622-2
98	Screw, Machine, Flat Head, ⊕ 3 x 6		911622X
99	Adapter, 45 RPM	RC-7116	890876
100	Not used		
101	Not used		
102	Clamper, Cord	RD-6219	911466
103	Cover, Hole	RD-6234	911639
104	Panel, Scale	RD-6235	873468
105	Washer, E-type, 2 x 5 x 0.4t		Y34000201
106	Holder, Tracking Sensor	RD-6220	911351
107	Spring, Coil, Tracking Sensor Holder	RD-6221	911609
108	Washer, Special, Tone arm, 10.1 x 34 x 1.6t	RD-6207	911353
109	Cord, AC Power Supply (for U.S.A./Canada)	W-1000	892435-1
	(included in Ref. No. 48-1) (for U.K.)		870913
	(for Australia)		891853-2
	(for Europe)		895617-2

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REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
110	Cable, Phono Output (for U.S.A./Canada)	W-2995	871474
	(included in Ref. No. 48-2) (for U.K./Australia/Europe)		870771
111	Plate, Main Control PCB Holding	RT-4621	911345
112	Lug		890755
113	Tube(Black), UL Insulation 3.3mm Dia x 60mm(L)		Z70300301
114	Fastener, Wire	RD-6222	894408
115	Label, Rating (for U.S.A.)		912856-1
	(for Canada)		912857-1
	(for U.K.)		912860-1
	(for Australia)		912859-1
	(for Europe)		912858-1
116	Washer, BS-type, 3 x 7 x 0.5t	HD-8739	912113
117	Tape, UL Insulation		U01330601
118	Spring, Coil, Elevation Lever	RD-6223	911521
119	Screw, Flange Tapping Tite, Pan Head, ⊕ 3 x 4		Y01300404
120	Bracket, Control	RD-6236	852734-1
121	Panel, Control (for U.S.A./Canada)	Z-6928	873467
	(for U.K./Australia/Europe)		873467-1
122	Spring (2), Button, SPEED/SIZE	RD-6225	912521
123	Plate, Screen, Tone arm Base	RT-4622	911531
124	Not used		
125	Button, Power	K-5221	912517
126	Holder, Position Sensor PCB	RD-6224	911346
127	Label, Serial Number		913098
128	Cable, Flat 8 cores (JL101) between Switching Control PCB for PLAY/CUE and Main Control PCB (included in REF NO. 139-6)		914433-3
129	Cable, Flat 6 cores (JL102) between Switching Control PCB for SPEED/SIZE and Main Control PCB (included in REF NO. 139-7)		914433-2
130	Cable, Flat 2 cores (JL103) between Pitch Control PCB and Main Control PCB (included in REF NO. 139-2)		914433
131	Connector Ass'y (1) between Photo Coupler PCB and Main Control PCB (included in REF NO. 132-2)		
	(for USA/Canada/U.K. Europe)		914335
	(for Australia)		914335-2
132-1	PCB Ass'y, Tracking Sensor	X-9899	911664-2A
132-2	PCB Ass'y, Photo Coupler		911664-2B
133	Tube, Silicon Glass		913098
134	Connector Ass'y (2) (JL104) between CNP1 of Motor PCB and Main Control PCB		914446
135	Cable, Flat 2 cores (JL105) between Strobe LED PCB and Main Control PCB (included in REF NO. 139-3)		914433
136	Spring (1), Button, PLAY/CUT/REPEAT/CUE/FF/FB	RD-6226	912520-1

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REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
137	Cable, Flat 5 cores (JL106) between Photo Transistor PCB, Position LED PCB and Main Control PCB (included in REF NO. 139-4)		914433-1
138	Knob, Pitch Control	K-5222	896614
139-1	PCB Ass'y, Main Control (for U.S.A./Canada)	X-9908	632380-1
	(for U.K./Australia/Europe)		632432-1
139-2	PCB Ass'y, Pitch Control	X-9900	632380-2
139-3	PCB Ass'y, Strobe LED	X-9901	632380-3
139-4	PCB Ass'y, Photo Transistor	X-9902	632380-4
139-5	PCB Ass'y, Position LED	X-9903	632380-5
139-6	PCB Ass'y, Switching Control for PLAY/CUE/REPEAT/FF/FB	X-9904	632380-6
139-7	PCB Ass'y, Switching Control for SPEED/SEZE	X-9905	632380-7
140	Not used		
141	Label, Fuse Caution (for U.S.A.)		894783-2
	(for Canada)		895019-1.
142	Label, Caution Safety (for U.S.A.)		913140
	(for Canada)		895020
143	Label, Warning (for U.S.A.)		893536
144	Label, UL (for U.S.A.)		894238
	CSA (for Canada)		893806
145	Label, Lightning Flash (for U.S.A.)		897621
146	Screw, Tapping Tite, Pan Head, ⊕ 4 x 10	HD-3047	Y10401001
	Screw Special, Transportation, ⊕ 4 x 4.5 (Hardware Kit)		911640

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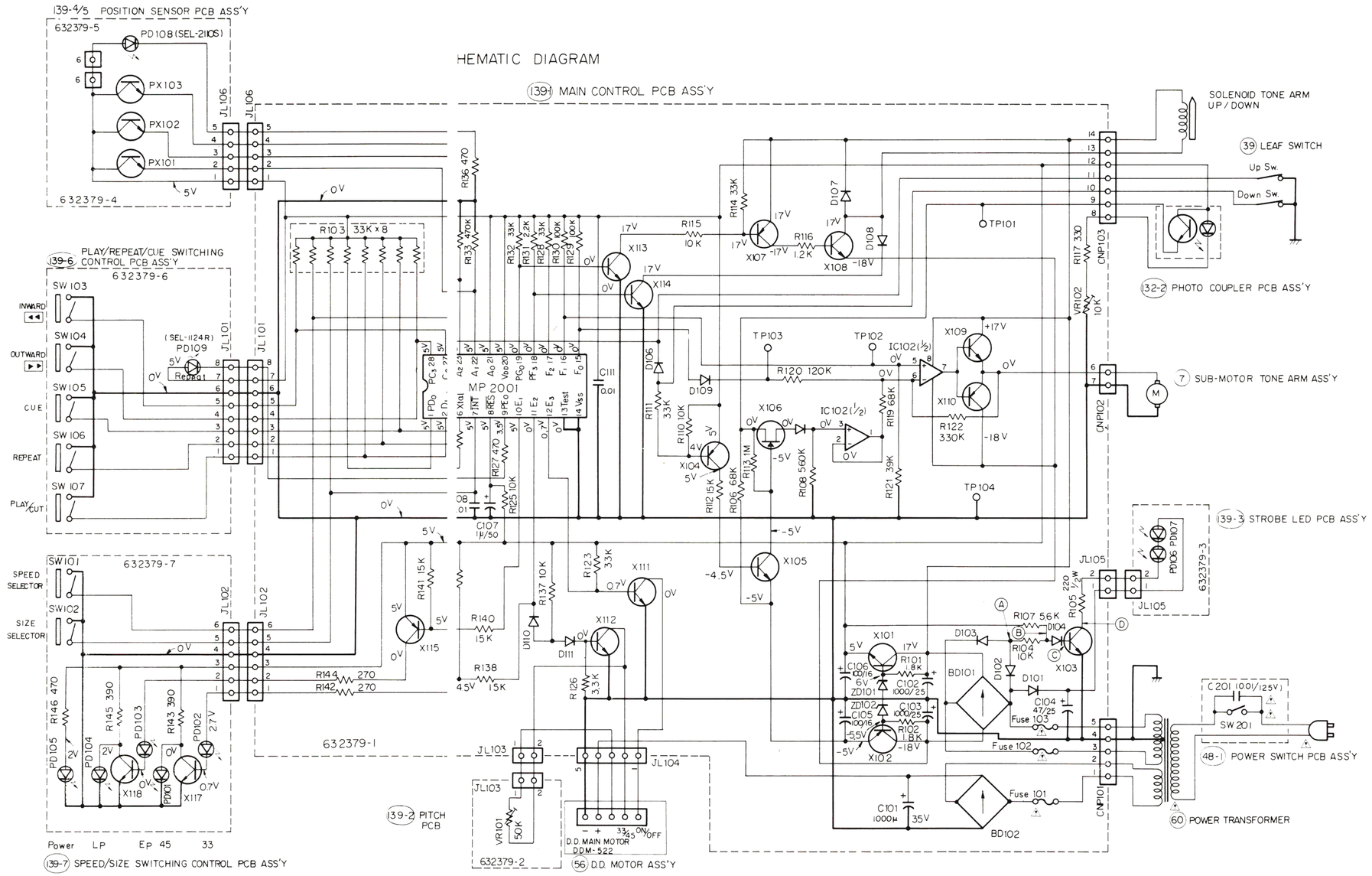
SCHEMATIC DIAGRAM



DIODES	
REF. NO.	DESCRIPTION
BD101-102	RB-151 Bridge
D101-106	IS953 or IS1588
D107-108	F14C, IS1877 or EM-1
D109-111	IS953 or IS1588
ZD101-102	Zener RD5.6E(B2), or HZ6B-1L

TRANSISTORS	
REF. NO.	DESCRIPTION
X101	2SD882 (Q), (P), (E)
X102	2SA952 (L), (K), or 2SA733 (Q), (P)
X103	2SC945 (Q), (P), or 2SC1815 (Y), (GR)
X104	2SA733 (Q), (P), or 2SA1015 (Y), (GR)
X105	2SC945 (Q), (P), or 2SC1815 (Y), (GR)
X106	2SK68 (L), (K)
X107	2SA733 (Q), (P), or 2SA1015 (Y), (GR)
X108,109	2SD667 (C), (D), 2SD571 (L), (K), or 2SC2655 (Y)
X110	2SB647 (C), (D), or 2SA1020 (Y)
X111-113	2SC945 (Q), (P), or 2SC1815 (Y), (GR)
X114	2SD667 (C), (D), 2SD571 (L), (K), or 2SC2655 (Y)
X115,116	2SA733 (Q) (P), or 2SA1015 (Y), (GR)

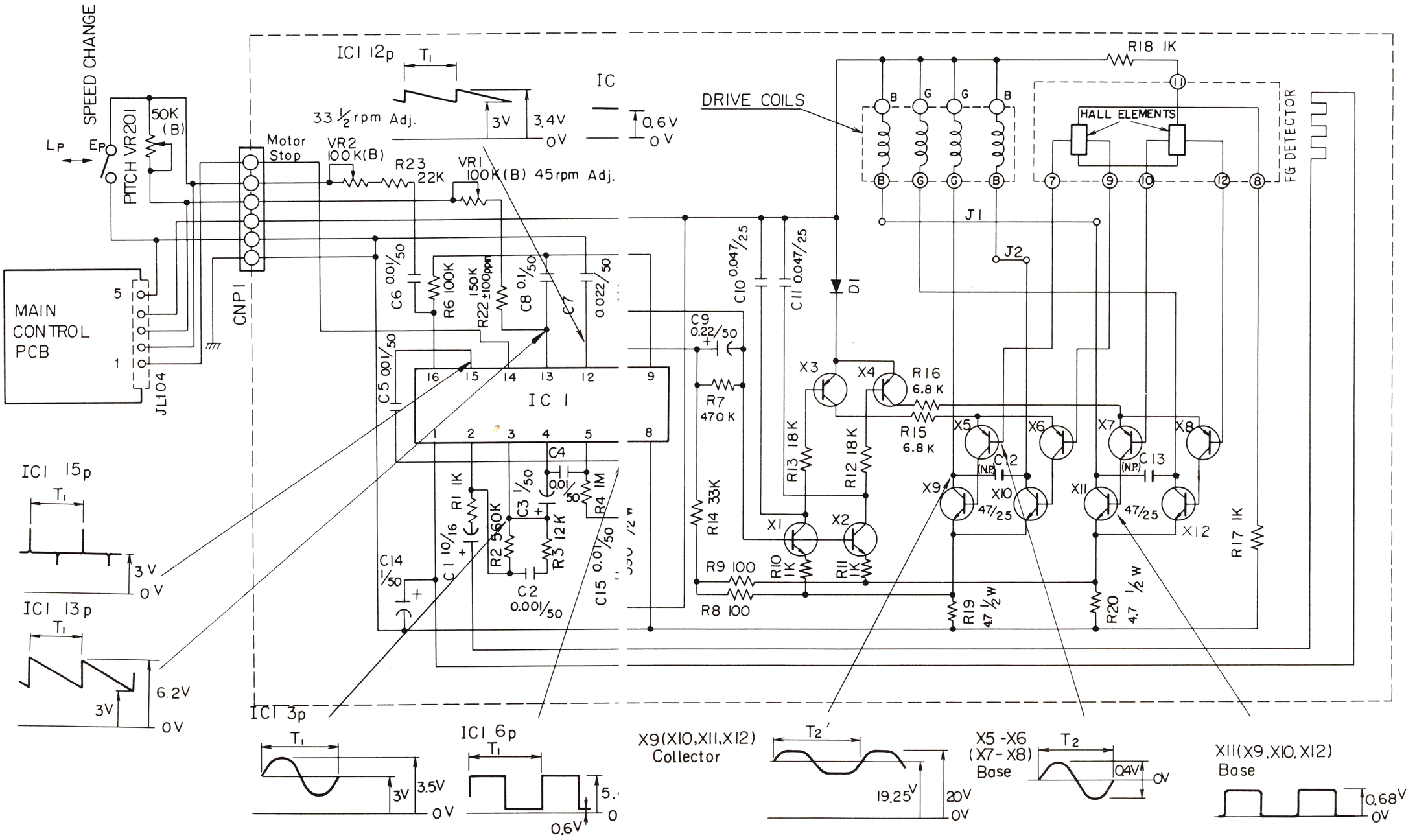
ICS	
REF. NO.	DESCRIPTION
IC101	MP2001 (Micro Processor)
IC102	μPC4558C, or NJM4558D

FUSES	
REF. NO.	DESCRIPTION
FUSE101	250V/1A for USA/Canada 250V/T400mA for UK/EC/Aust.
FUSE102	250V/1A for USA/Canada 250V/T500mA for UK/EC/Aust.
FUSE103	250V/1A for USA/Canada 250V/T500mA for UK/EC/Aust.

NOTES:

1) Resistors in brackets ( ) are printed-resistors (PRC and are available only with P.C. Board (No. 632379-1
2) Power source for IC101 is ±5V, and ±15V for IC102.
3) Up-SW1 is switched on when tone arm up-motion i completed.
4) Up-SW2 is switched on when tone arm contacts th Elevation Rubber.
5) All resistors are in ohms and 1/4W, unless otherwis specified.
6) All capacitors are valued in μF, unless otherwis specified.
7) Products marked with a ⚠ have special characteristic important to safety. The use of substitute replacemen parts that do not have the same safety characteristic may create shock, fire, or other hazards.
8) After servicing this appliance and before returning tc the customer, confirm the insulation resistance bet ween each blade (or pin) of power cord plug and the spindle of turntable platter is more than 10 Megohms.

SCHEMATIC DIAGRAM AIN MOTOR CONTROL 56.)



NOTES:

1) T1 is 22.5mm/sec for 33-1/3 rpm.
   T2 is 16.7mm/sec for 45 rpm.
2) All resistors are in ohm and 1/4W, unless otherwise specified.

TRANSISTORS	
REF. NO.	**DESCRIPTION**
X3- X8	Transistor, 2SA733 (P), (Q) or 2SA844 (C), (D) or 2SA1015 (Y), (GR) or 2SA1175 (F), (E)
X9- X12	Transistor, 2SC2001 (K), (L) or 2SC2120 (Y), (GR)

ICS and TRANSISTORS	
REF. NO.	**DESCRIPTION**
IC1	IC, μPC1043C
X1- X2	Transistor, 2SC945 (P), (Q) or 2SC2308 (C) or 2SC1815 (Y), (GR) or 2SC2785 (F), (E)

DIODES	
REF. NO.	**DESCRIPTION**
D1	1SS53, 1S953, or 1S1588
ZD1	Zener RD-13E (B3)

RADIO SHACK, A DIVISION OF TANDY CORPORATION

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CANADA: BARRIE, ONTARIO L4M 4W5

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